Guru Nanak Dev Engineering College, Ludhiana			
Department of Computer Science & Engineering			
Program	B.Tech.(CSE)	Semester	4
Subject Code	PCCS-103	Subject Title	Discrete Mathematics
Mid Semester Examination (MSE) No.	1	Course Coordinator(s)	Dr. Manpreet Kaur Mand Prof. Shailja Sharma
Max. Marks	24	Time Duration	1 hour 30 minutes
Date of MSE	12th Feb, 2024	Roll Number	2203482 .

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	Let U = {1,2,3,4,5,6,7,8,9}, A= {1,2,3,4}, B = {2,4,6,8} and C= {3,4,5,6}. Find (i) $(A \cup B)^c$ (ii) $(B-C)^c$.	CO1, L2	2
Q2	Determine the validity of following argument: $[(p \rightarrow q) \wedge \neg q] \rightarrow \neg p$.	CO2, L5	2
Q3	Let R be a binary relation defined as R: {(a, b) ∈ R: (a-b) ≤ 3}. Find whether R is reflexive, symmetric, transitive and anti-symmetric?	CO1, L2	4
Q4	A collection of 10 electric bulbs contains 3 defective ones. a. In how many ways can a sample of 4 bulbs be selected? b. In how many ways can a sample of 4 bulbs be selected which contains 2 good bulbs and 2 defective ones? c. In how many ways can a sample of 4 bulbs be selected so that the sample contains 3 good ones and 1 defective one? d. In how many ways can a sample of 4 bulbs be selected so that the sample contains 1 good and 3 defective ones?	CO3 L3	4
Q5	Solve the recurrence relation T(k) + T(k-1) − 5T(k-2) + 3T(k-3) = 0 with T (0) =0, T (1) =1 and T (2) =2.	CO4, L5	4
Q6	Solve the recurrence relation $A_r - 9A_{r-1} + 20A_{r-2} = 0$ for n≥2 using generating functions with base conditions $A_0 = -3$ and $A_1 = -10$.	CO4, L5	8

Course Outcomes (CO)	
Students will be able to	
1	Apply sets, relations and functions to solve problems.
2	Construct mathematical proofs to verify the correctness of an argument using propositional logic, predicate logic and truth tables.
3	Apply counting techniques and combinatorics to determine discrete probability.
4	Solve problems involving recurrence relations and generating functions.
5	Prove elementary properties of algebraic structures in analysis and interpretation of data to provide valid conclusions.
6	Make use of graphs and trees to model real world problems.

RBT	Lower Order Thinking Levels (LOTS)			Higher Order Thinking Levels (HOTS)		
RBT Level	L1	L2	L3	L4	L5	L6
RBT Level	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

Guru Nanak Dev Engineering College, Ludhiana			
Department of Computer Science and Engineering			
Program	B-Tech CSE	**Semester**	4th
Subject Code	PCCS-104	**Subject Title**	Computer Architecture & Microprocessor
Mid Semester Exam (MSE) No.	1	**Course Coordinator(s)**	Er. Vandna Er. Lakhvir Kaur Grewal Er. Harminder Kaur
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MSE	13th Feb.,2024	**Roll Number**	2203492

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1.	Differentiate between Hardwired Control and Microprogrammed Control.	CO3, L2	2
Q2.	Demonstrate the arithmetic operations (+40) + (-15) in binary using 8-bit signed 2's complement representation for negative numbers.	CO1, L4	2
Q3.	Explain in detail the different mappings used for cache memory.	CO6, L2	4
Q4.	Discuss the method to perform arithmetic addition in the computer system? Give an example for binary fixed-point addition.	CO1, L2	4
Q5.	Identify the step by step procedure to multiply two numbers {(- 7) x (- 3)} using booth's multiplication algorithm.	CO2, L4	4
Q6.	Design a diagram to represent the relationship between various computer registers in a common bus system. Also, elaborate the basic organization of these registers along with their roles using suitable examples.	CO3, L4	8

Course Outcomes (CO) *Students will be able to….*

1.	Explain the binary number system and its representations in computer system.
2.	Implement Arithmetic, Logical and Shift micro operations using Register Transfer Language.
3.	Describe the structure and organization of basic computer using instruction set architecture.
4.	Elaborate instruction formats, RISC and CISC architectures and addressing modes.
5.	Solve basic binary math operations through programming of 8085 microprocessor.
6.	Make use of memory mapped and I/O mapped interfacing in microprocessor applications

RBT Classification	Lower Order Thinking Levels (LOTS)			Higher Order Thinking Levels (HOTS)		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

Guru Nanak Dev Engineering College, Ludhiana

Department of Computer Science and Engineering

Program	B.Tech.(CSE)	**Semester**	4th
Subject Code	PCCS-105	**Subject Title**	Operating Systems
Mid Semester Examination (MSE) No.	1	**Course Coordinator(s)**	Prof. Amanpreet Singh Brar Dr. Daljit Singh Prof. HarkomalpreetKaur
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MSE	14th Feb, 2024	**Roll Number**	2203492.

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	Classify the difference between Real time Operating system and Time sharing Operating system.	CO1, L2	2
Q2	Difference between kernel level thread and user level thread with demonstration.	CO3, L4	2
Q3	Demonstrate the Process control block with respect to process states.	CO3, L2	4
Q4	Explain the different types of operating system architecture in detail.	CO1, L2	4
Q5	Compare and contrast different types of system calls. Justify with appropriate examples.	CO1, L4	4
Q6	Arrival and Burst time of four processes P1, P2, P3, P4 are given. 1.Draw Gantt Chart and Evaluate Average Waiting time and turnaround time using FCFS, SJF (preemptive, non-preemptive), Priority(preemptive , non-preemptive) and RR Scheduling (Quantum =2 ms). 2. What is the waiting time of each process for each of the above algorithm? 3. Which algorithm results in minimum average waiting time? Note:- Assume 1 to be the higher priority	CO2, L4	8

Process	Burst Time	Arrival time	Priority
P1	5	0	2
P2	15	1	3
P3	10	2	1

Course Outcomes (CO) *Students will be able to*

1	Explain the types and functions of operating systems.
2	Evaluate different scheduling Techniques and list resources involved in process creation and management
3	Discuss inter-process communication, deadlock prevention, avoidance, detection and recovery techniques.Understand the mechanisms of OS to handle processes and threads and their communication
4	Comprehend the mechanisms used in memory management
5	Apply file management mechanisms for efficiency and performance.
6	Make use of disk scheduling algorithms

RBT Classification	Lower Order Thinking Levels (LOTS)			Higher Order Thinking Levels (HOTS)		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

Guru Nanak Dev Engineering College, Ludhiana

Department of Computer Science & Engineering

Program	B.Tech.(CSE)	**Semester**	4th
Subject Code	PCCS-106	**Subject Title**	Data Structures
Mid Semester Examination (MSE)No.	1	**Course Coordinator(s)**	Supreet Kaur, Jasmine Kaur
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MSE	15-02-2023	**Roll Number**	2203482.

Note: Attempt all questions

Q. No.	Questions	COs, RBT level	Marks
Q1	Write an algorithm to delete an element at end in doubly linked list.	CO2 L3	2
Q2	Consider the following sequence of operation on an empty stack push(54),push(52),pop(),push(55),push(62), s=pop(); Consider the following sequence of operation on an empty queue enqueue(21),enqueue(24),dequeue(),enqueue(28),enqueue(32),q= dequeue(21) Diagrammatically show the of status of stacks and queues and find the value of s+q.	CO3, CO4 L5	2
Q3	Explain the operations that can be performed on priority queues. Also list the applications of priority queues.	CO5, L2	4
Q4	Given an array, **arr[1:9, -4:1, 5:10]** with a base value of **400** and the size of each element is **2 Bytes** in memory find the address of element **arr[5][-1][8]** with the help of an array is stored in row-major order?	CO2, L3	4
Q5	Design an algorithm to reverse the elements of a singly linked list. Also determine the Worst case Time Complexity of this algorithm.	CO1, CO2, L6	4
Q6	a) With the help of stacks convert the following infix expression to postfix expression and evaluate it. a-b-d*e/(f+b)*c where a=30, b=1, c=3, d=2, e=3, f=1. b) Justify how stacks give an efficient solution to the problem of Hanoi for 3 discs.	CO3 , L5	8

Course Outcomes (CO)

Students will be able to

1	Identify the appropriate data structure to provide solution with reduced space and time complexity.
2	Implement the storage of linear data in arrays, linked list and hashing technique.
3	Utilize stacks for solving problems that works on the principle of recursion.
4	Make use of queues in solving problems having sequential processing.
5	Implement the concept of non-linear data structures-tree and graph in real world problems.
6	Analyse efficiency of different algorithms for searching and sorting.

RBT Classification	Lower Order Thinking Levels (LOTS)			Higher Order Thinking Levels (HOTS)		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

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Guru Nanak Dev Engineering College, Ludhiana

Department of Computer Science and Engineering

Program	B.Tech.(CSE)	Semester	4th
Subject Code	PCCS-107	Subject Title	Software Engineering
Mid Semester Exam (MSE) No.	1	Course Coordinator(s)	Dr. Kiran Jyoti Er. Jasdeep Kaur Dr. Hardeep Singh Kang
Max. Marks	24	Time Duration	1 hour 30 minutes
Date of MSE	16th Feb, 2024	Roll Number	2203482

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
	Illustrate the importance of feasibility study in requirement analysis.	CO1, CO2, L2	2
	"The emphasis of exploratory programming is error correction while software engineering practice emphasize on error prevention" Do you agree? Justify your answer.	CO1, L4	2
Q3	"Software development project estimation is often laborious and time-consuming." Comment. A simple stand - alone software utility is to be developed in 'C' programming by a team of software experts for a computer running Linux and the overall size of this software is estimated to be 20,000 lines of code. Considering (a, b) = (2.4, 1.05) as multiplicative and exponentiation factor for the basic COCOMO effort estimation equation and (c, d)=(2.5, 0.38) as multiplicative and exponentiation factor for the basic COCOMO development time estimation equation, approximately how long does the software project take to complete ?	CO3, L3	4
Q4	List several software process paradigms. Explain how both waterfall model and prototyping model can be accommodated in the spiral process model.	CO1, L2	4
Q5	Create a Software Requirement Specification (SRS) for "scheduling the courses in a computer science department, based on the input about classrooms, lecture times, and time preferences of the different instructors" that includes the following: 1. A detailed description of both user and system requirements. At least four (4) user requirements and four (4) system requirements should be provided. 2. A detailed description of both functional and nonfunctional requirements. At least four (4) functional requirements and four (4) nonfunctional requirements should be provided.	CO2, L6	4
Q6	Following figure sets out a number of activities, durations and dependencies. Design an activity Network diagram using AOA or AON and a GANT chart showing the project schedule. Also describe the responsibilities of Project Manager.	CO3, L6	8

Task	Duration(days)	Dependencies
T1	10	-
T2	15	T1
T3	10	T1, T2
T4	20	-
T5	10	-
T6	15	T3, T4
T7	10	T3
T8	35	T7
T9	15	T6
T10	5	T5, T9
T11	10	T9
T12	20	T10
T13	35	T3, T4
T14	10	T8, T9
T15	20	T12, T14
T16	10	T15

Course Outcomes (CO): *Students will be able to*

CO1	Explain software process models and fundamentals of software engineering to use suitable process model for a given scenario.
CO2	Analyse software requirements for designing SRS documents
CO3	Analyze and translate a specification into a design, and then realize that design practically, using an appropriate software engineering methodology.
CO4	Apply software design strategies to translate SRS to software design
CO5	Apply coding standards and testing techniques for a given software design.
CO6	Recognize the importance of software maintenance , PSP, Six Sigma and re-engineering

RBT Classification	Lower Order Thinking Levels (LOTS)			Higher Order Thinking Levels (HOTS)		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

Guru Nanak Dev Engineering College, Ludhiana			
Department of Computer Science and Engineering			
Program	B.Tech. (CSE)	**Semester**	4th (A, B & C)
Subject Code	MCCS-101	**Subject Title**	Environmental Sciences
Mid Semester Exam (MSE) No.	1	**Course Coordinator(s)**	Pf. Kuljit Kaur Pf. Jaswant Singh Er. Vandna
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MSE	16/02/2024	**Roll Number**	2203492

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	Differentiate renewable and non-renewable resources.	L2, CO1	2
Q2	Analyze how human activities contribute to landslides.	L4, CO2	2
Q3	Give an account of the effects of timber extraction, mining dams on forests and tribal people.	L2, CO5	4
Q4	Discuss the use and over-utilization of surface and ground water.	L2, CO3	4
Q5	Consider a scenario in which a new species, introduced accidentally into an existing ecosystem, begins to outcompete native species for resources. Explain the potential consequences of this introduction on the overall stability of the ecosystem.	L5, CO4	4
Q6	Imagine a scenario where a rapidly growing urban population demands more land for housing and infrastructure development. The government is considering clearing a significant portion of a nearby forest to meet these demands. Discuss the potential environmental consequences of such a decision.	L4, CO5	8

Course Outcomes (CO) ***Students will be able to….***

1.	Measure environmental variables and interpret results.
2.	Evaluate local, regional and global environment topics related to resource use and management.
3.	Propose solutions to environmental problems related to resource use and management.
4.	Interpret the results of scientific studies of environmental problems.
5.	Describe threats to global biodiversity, their implications and potential solutions.

RBT Classification	Lower Order Thinking Levels (LOTS)			Higher Order Thinking Levels (HOTS)		
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RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating