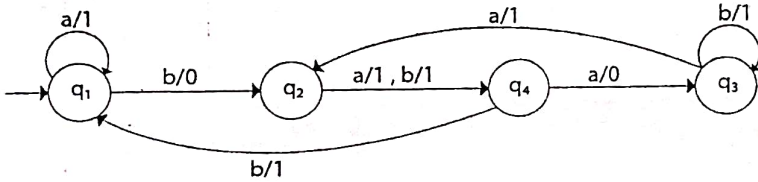
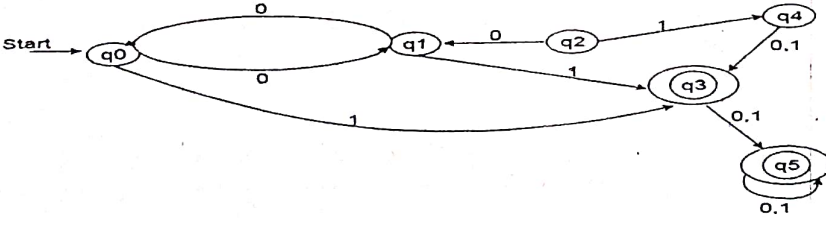


Guru Nanak Dev Engineering College, Ludhiana			
Department of Information Technology			
Program	B.Tech.(IT)	Semester	5 <sup>th</sup>
Subject Code	PCIT-112	Subject Title	Theory of Computation
Mid Semester Test (MST) No.	1	Course Coordinator(s)	Prof. Rupinder Kaur
Max. Marks	24	Time Duration	1 hour 30 minutes
Date of MST	Sept 18, 2024	Roll Number	2203751
Note: Attempt all questions			
Q. No.	Question	COs, RBT level	Marks
Q1	Distinguish DFA and NDFA.	CO1, L2	2
Q2	Design a DFA for $ w  \bmod 5 = 0$ over alphabet set $\{a, b\}$	CO4, L6	2
Q3	Articulate the following Mealy machine into equivalent Moore machine.	CO1, L3	4
			
Q4	Explain Chomsky Classification of Languages in detail.	CO2, L2	4
Q5	Prove by Pumping Lemma that the given language $L = \{a^p b^p \mid p \geq 1\}$ is regular or not.	CO3, L5	
Q6	Design the minimized Finite Automata from the figure given below. Also Illustrate the need for minimization of automata.	CO1, L6	8
			

*Optimal*

Guru Nanak Dev Engineering College, Ludhiana			
Department of Information Technology			
Program	B.Tech.(IT)	Semester	5
Subject Code	PCIT-111	Subject Title	Internet of Things
Mid Semester Examination (MSE) No.	1	Course Coordinator	Prof. Himani Sharma
Max. Marks	24	Time Duration	1 hour 30 minutes
Date Of MST		Roll Number	

Note: Attempt all questions

Q.No.	Question	COs, RBT Level	Marks
Q1	Discuss MAC layer handle frame formatting and queuing.	CO3, L3	2
Q2	Compare and contrast the DHT11/DHT22 sensors with Arduino/python code to print temperature and humidity readings.	CO1, L6	2
Q3	In terms of web connectivity, justify the functionalities of the JSON Format, Tag Length Value Format and MIME?	CO2, L3	4
Q4	Elucidate the various domains and services capabilities in ETSI high level architecture for applications and services in the internet of ATM machine.	CO2, L2	4
Q5	Elaborate the different communication mediums NFC, BLE, Zigbee and Wifi compare in terms of range, data rate, power consumption and security.	CO2, L4	4
Q6	Design and develop the Architectural view of an M2M application for a car for traffic reports, control and monitoring.	CO1, L6	8

Course Outcomes (CO) Students will be able to

1	Analyze IOT in terms of Conceptual framework
2	Illustrate the design principles for connected devices and web- connectivity
3	Discriminate the functionality of IP and MAC addresses along with the application layer protocols
4	Outline cloud computing paradigm for data Collection, storage and computing services
5	Elucidate sensor technology for sensing the real world using analog and digital sensors
6	Outline security tomography of large networks and layered attacker model

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

Guru Nanak Dev Engineering College, Ludhiana			
Department of Information Technology			
Program	B.Tech.(IT)	Semester	5
Subject Code	PCIT-110	Subject Title	Discrete Mathematics
MSE No.	1	Course Coordinator(s)	Jaskiran Kaur
Max. Marks	24	Time Duration	1 hour 30 minutes
Date	16-09-2024	Roll Number	2221139
Note: Attempt all questions			
Q. No.	Question	COs, RBT level	Marks
Q1	In how many of the distinct permutations of the letters in MISSISSIPPI do the four I's not come together?	CO5, L3	2
Q2	In a small village, there are 97 families, of which 56 families have at most 2 children. In a rural development program, 20 families are to be chosen for assistance, of which at least 18 families must have at most 2 children. In how many ways can the choice be made?	CO5, L4	2
Q3	Let $X = \{4, 5, 6\}$ , $Y = \{a, b, c\}$ and $Z = \{l, m, n\}$ . Consider the relation $R1$ from $X$ to $Y$ and $R2$ from $Y$ to $Z$ .  $R1 = \{(4, a), (4, b), (5, c), (6, a), (6, c)\}$ , $R2 = \{(a, l), (a, n), (b, l), (b, m), (c, l), (c, m), (c, n)\}$  Find: a) $R1 \circ R1$ b) $R1 \circ R2$ c) $R2 \circ R1$ d) $R2 \circ R2$	CO1, L2, L3	4
Q4	Define the following terms with suitable examples:  a) Inclusion- Exclusion Principle b) Partial order relations c) Pigeonhole Principle d) Hashing Function	CO1, L1	4
Q5	In a survey of 500 students of a college, it was found that 49% liked watching football, 53% liked watching hockey and 62% liked watching basketball. Also, 27% liked watching football and hockey both, 29% liked watching basketball and hockey both and 28% liked watching football and basket ball both. 5% liked watching none of these games.  i) How many students like watching all the three games? ii) Find the ratio of number of students who like watching only football to those who like watching only hockey. iii) Find the number of students who like watching only one of the three given games. iv) Find the number of students who like watching at least two of the given games.	CO1, CO5, L4	4
Q6	Examine the usage of Recurrence Relations and solve:  $t_n = 4(t_{n-1} + t_{n-2})$ where $t_n = 1$ if $n=0$ and $n=1$	CO3, L4	6



Guru Nanak Dev Engineering College, Ludhiana			
Department of Information Technology			
Program	B.Tech.(IT)	Semester	5 <sup>th</sup>
Subject Code	PCIT-109	Subject Title	Programming in Java
MSE No.	1	Course Coordinator(s)	Pf.Gitanjali Sharda Pf.Reema verma
Max. Marks	24	Time Duration	1 hour 30 minutes
Date of MST	19/09/2024	Roll Number	

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	Elaborate how automatic <b>garbage collection</b> impacts memory management compared to manual memory management techniques.	CO2,L2	2
Q2	What will be the output of code: Note: Write the code along with your answer. <pre> class jump { public static void main(String args[]) {     int x = 2; int y = 0; 12     for ( ; y &lt; 10; ++y)     { if (y % x == 0)       continue;       else if (y == 8)       break;       else System.out.print(y + " "); } } }</pre> <p style="text-align: center;">1 3 5 7 9</p>	CO1,L6	2
Q3	Demonstrate <b>method overloading</b> and <b>method overriding</b> by analyzing their roles in class hierarchies, their effects on method signature and inheritance, and their implications for code maintainability and extensibility.	CO2, L3	4
Q4	Illustrate how runtime polymorphism is achieved when a superclass reference variable points to subclass objects. Discuss how the program determines which method to execute at runtime."	CO2, L2	4
Q5	Design a menu driven code using methods to handle following: a) Start counting from the input number incrementing the value by 1 for each iteration .the counting stops once the current value is divisible by 10. b) Find the count of factors for a given number.eg factors of 10 are 1,2,5,10 and count in this case is 4.	CO2, L5	4
Q6	a) Design a class hierarchy for a banking system that includes classes for <u>Account</u> , <u>SavingsAccount</u> , and <u>CheckingAccount</u> , incorporating polymorphism and inheritance. b) If a class defines several constructor, is it feasible to invoke one constructor from another constructor? Justify your ans.	CO6 ,L6 CO2 ,L4	8(4+4)

Course Outcomes (CO): Students will be able to

1	Use primitive data types, operators and control statements to develop programs.
2	Discuss methods and arrays along-with basic object oriented principles.
3	Implement exception handling, multithreading, string handling, packages and interfaces.
4	Develop event handling based components for interaction of the user with a GUI.
5	Create logic based application by the use of strings.
6	Identify and solve complex problems in the environment of Java programming.

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Guru Nanak Dev Engineering College, Ludhiana			
Department of Information Technology			
Program	B.Tech.(IT)	Semester	5
Subject Code	PEIT-102	Subject Title	Advanced Web Technologies
Mid Semester Examination (MSE) No.	1	Course Coordinator(s)	Akshay Girdhar
Max. Marks	24	Time Duration	1 hour 30 minutes
Date of MSE	19 <sup>th</sup> September, 2024	Roll Number	

**Note:** Attempt all questions. All assumptions must be clearly stated.

Q. No.	Question	COs, RBT level	Marks
Q1	Can using Bootstrap speed up development time? Why or why not?	CO1, L5	2
Q2	Differentiate between <b>git status</b> and <b>git diff</b> command.	CO3, L2	2
Q3	How does a grid system improve flexibility in table design? Provide a demonstration.	CO1, L3	4
Q4	Outline the step-by-step procedures involved in both <u>pushing local changes to the remote repository</u> and <u>pulling updates from the remote</u> . Include an in-depth explanation of the associated GIT commands, their purpose, and how they interact with the repository to ensure a smooth workflow.	CO3, L4	4
Q5	Create a fully responsive Bootstrap-based navigation bar for a website that includes dropdown menus. Provide a detailed explanation of the structure	CO1, L3	4
Q6	Imagine you are working on a collaborative web development project using Bootstrap 5 and GIT. Your team is facing challenges in maintaining consistent styling and layout across different web pages. Additionally, you need to address issues related to version control conflicts in GIT. a) Propose a strategy for ensuring consistent styling and layout across multiple web pages using Bootstrap 5. b) Outline a plan to manage version control conflicts effectively in GIT, considering the challenges faced by your team. Above 2 points must be addressed with the help of student registration for admission to any program.	CO1, CO3, L6	8

#### Course Outcomes (CO)

*Students will be able to*

1	Apply the knowledge of HTML5 based Bootstrap framework for web page designing
2	Create and design web applications using MVC approach and Bootstrap.
3	Demonstrate the understanding of version control and data repository maintenance using GIT
4	Develop web applications using the PHP frameworks.
5	Identify, formulate and solve engineering problems in the area of dynamic web applications.

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