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INSTITUTE OF ENGINEERING & TECHNOLOGY

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Lab Plan of Each Lab Course-IV Sem (Session 2024-25(EVEN))

DEPARTMENT OF COMPUTER ENGINEERING



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Introduction

This Lab Manual has been developed by the Department of Computer Engineering for the B.Tech Program as part of the B.Tech Computer Engineering curriculum. The lab sessions are designed to provide students with practical exposure to theoretical concepts, fostering a deeper understanding of Theoretical through hands-on experimentation. The experiments outlined in this manual are carefully aligned with the program and course outcomes, ensuring that students acquire essential competencies. Through the laboratory, the department aims to encourage experiential learning, promote collaboration, and cultivate critical thinking.

Objectives

The primary objectives of this lab are to:

- Provide students with hands-on experience
- Develop practical skills in Students
- Enhance students' ability to apply theoretical knowledge to real-world problems.
- Foster an environment of curiosity, innovation, and critical thinking.

LAB RULES

Always:

- Enter the lab on time and leave at proper time.
- Wait for the previous class to leave before the next class enters.
- Keep the bag outside in the respective racks.
- Utilize lab hours in the corresponding.
- Turn off the machine before leaving the lab unless a member of lab staff has specifically told you not to do so.
- Leave the labs at least as nice as you found them.
- If you notice a problem with a piece of equipment (e.g. a computer doesn't respond) or the room in general (e.g. cooling, heating, lighting) please report it to lab staff immediately. Do not attempt to fix the problem yourself.

Never:

- Don't abuse the equipment.
- Do not adjust the heat or air conditioners. If you feel the temperature is not properly set, inform lab staff; we will attempt to maintain a balance that is healthy for people and machines.
- Do not attempt to reboot a computer. Report problems to lab staff.
- Do not remove or modify any software or file without permission.
- Do not remove printers and machines from the network without being explicitly told to do so by lab staff.



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- Don't monopolize equipment. If you're going to be away from your machine for more than 10 or 15 minutes, log out before leaving. This is both for the security of your account, and to ensure that others are able to use the lab resources while you are not.
- Don't use internet, internet chat of any kind in your regular lab schedule.
- Do not download or upload of MP3, JPG or MPEG files.
- No games are allowed in the lab sessions.
- No hardware including USB drives can be connected or disconnected in the labs without prior permission of the lab in-charge.
- No food or drink is allowed in the lab or near any of the equipment. Aside from the fact that it leaves a mess and attracts pests, spilling anything on a keyboard or other piece of computer equipment could cause permanent, irreparable, and costly damage. (and in fact *has*) If you need to eat or drink, take a break and do so in the canteen.
- Don't bring any external material in the lab, except your lab record, copy and books.
- Don't bring the mobile phones in the lab. If necessary, then keep them in silence mode.
- Please be considerate of those around you, especially in terms of noise level. While labs are a natural place for conversations of all types, kindly keep the volume turned down.

If you are having problems or questions, please go to either the faculty, lab in-charge or the lab supporting staff. They will help you. We need your full support and cooperation for smooth functioning of the lab.

INSTRUCTIONS

Before entering in the lab

- All the students are supposed to prepare the theory regarding the next experiment.
- Students are supposed to bring the practical file and the lab copy.
- Previous programs should be written in the practical file.
- All the students must follow the instructions, failing which he/she may not be allowed in the lab.

While working in the lab

- Adhere to experimental schedule as instructed by the lab in-charge.
- Get the previously executed program signed by the instructor.
- Get the output of the current program checked by the instructor in the lab copy.
- Each student should work on his/her assigned computer at each turn of the lab.
- Take responsibility of valuable accessories.
- Concentrate on the assigned practical and do not play games
- If anyone caught red handed carrying any equipment of the lab, then he/she will have to face serious consequences.

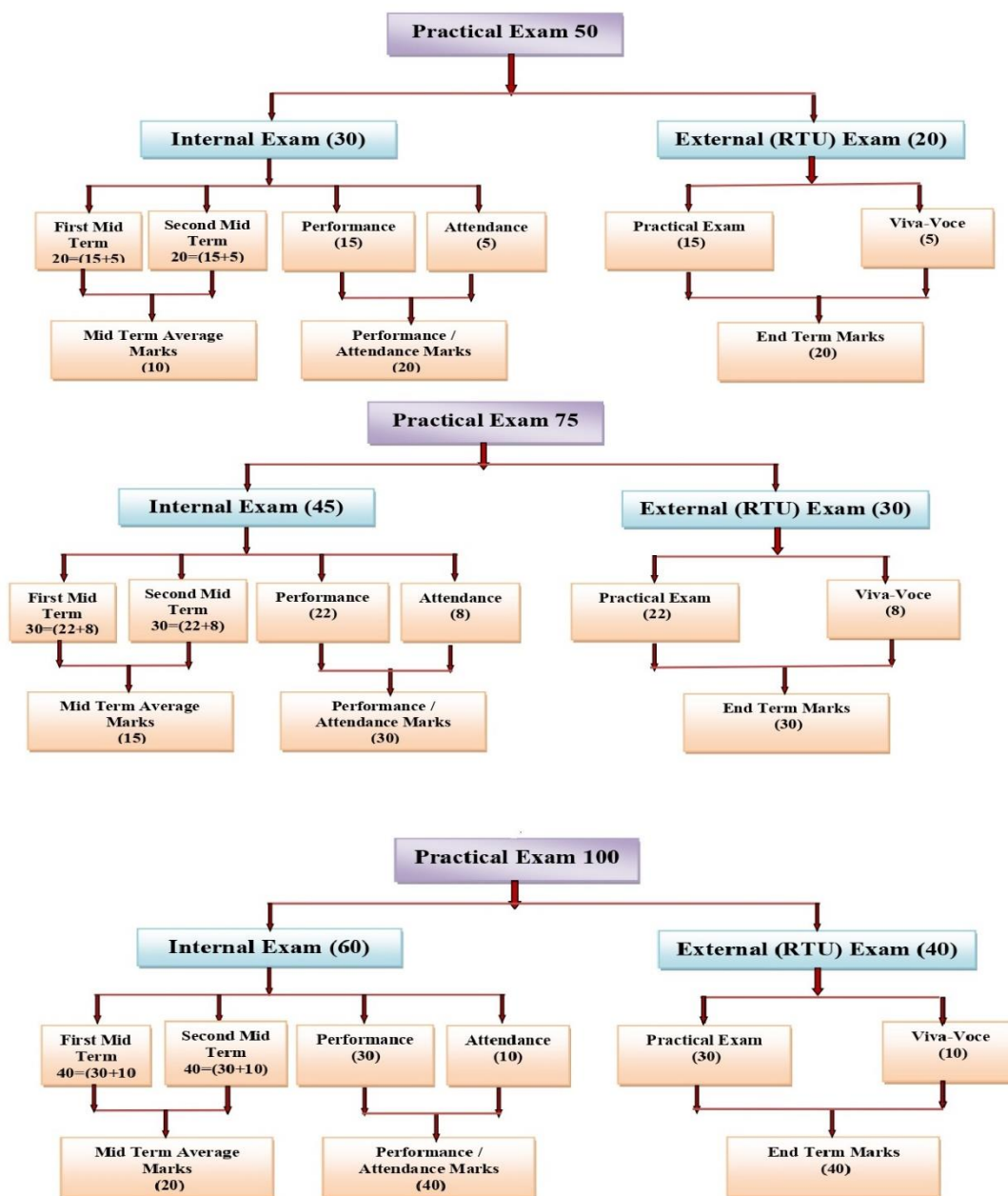


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MARKS SCHEME

POORNIMA INSTITUTE OF ENGINEERING & TECHNOLOGY, JAIPUR MARKS DISTRIBUTION FOR PRACTICAL EXAM





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LAB PLAN FOR – IV SEM

MICROPROCESSOR & INTERFACES LAB 4CS4-21

LTP: 0L+0T+2P

Subject Name/Code	CO Definition
CO1	Analyze the fundamentals of assembly level programming
CO2	Apply interfacing concept between input and output devices.
CO3	Elaborate the interfacing of various other devices with microprocessor.
CO4	Compose the various programs on different problems using Assembly Language Programming.
CO5	Implement standard microprocessor real time interfaces including digital-to-analog converters and analog-to-digital converters

Exp. No.	Laboratory Experiments
1	Zero Lab (Lab rules, Introduction to different types of microprocessor and microcontroller. Application of Microprocessor and microcontroller)
2	Add the contents of memory locations XX00 & XX01 & place the result in Memory location XX02 and Register pair.(With Carry and Without Carry)
3	Add the 16 bit numbers stored in memory location & store the result in Another memory location. and Register pair.(With Carry and Without Carry)
4	Write a program to swap two blocks of data stored in memory.
5	Transfer a block of data from memory location XX00 to another memory location XX00 in forward & reverse order.
	I MIDTERM EXAMINATION
6	Write a program to add ten 8 bit numbers stored in memory location XX00 & store the result in another memory location and in Register Pair.



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7	Write a program to multiply two 8 bit numbers whose result is 16 bit, & store the result in another memory location and in Register Pair.
8	Write a program to find the square of a number. & store the result in another memory location and in Register.
9	Write a program of division of two 8 bit numbers.(Using DAD Instruction and without DAD Instruction.)
10	Write a program to find largest & smallest number from a given array.
II MIDTERM EXAMINATION	



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DATABASE MANAGEMENT SYSTEM LAB 4CS4-22

LTP: 0L+0T+2P

Subject Name/Code	CO Definition
CO1	Create and execute a database schema for a specified problem domain
CO2	Manage integrity constraints within a database using a relational database management system (RDBMS),
CO3	Construct and Devise a graphical user interface (GUI) application using a fourth-generation programming language (3GL).
CO4	Composing PL/SQL code encompassing stored procedures, stored functions, cursors, and packages.
CO5	Produce SQL and Procedural interfaces to SQL comprehensively.

Tools/software: Oracle Enterprise Edition

Exp. No.	Laboratory Experiments
0	Zero Lab Introduction to MYSQL
1	Execute DDL Statements in SQL like Create, Alter, Drop, Truncate
2	Execute Different constraints Like Primary key, Foreign key, Not Null, Unique and Check
3	Execute DML Statements in SQL Like Insert, Select, Delete and Update
4	Execute query of Aggregate functions Like MAX (), MIN(), AVG() and COUNT(), HEAD(),TAIL()
5	Write the queries to implement the joins. (inner, outer, left and right)
I MIDTERM EXAMINATION	
6	Write a Program to explain the concept of Variable and Constant in PL/SQL



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7	Write a Program to explain the concept of Control Statement in PL/SQL
8	Write a Program to explain the concept of Procedure and Functions in PL/SQL
9	Write a Program to explain the concept of Cursor in PL/SQL
10	Write a Program to explain the concept of Trigger in PL/SQL
II MIDTERM EXAMINATION	



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NETWORK PROGRAMMING LAB 4CS4-23

LTP: 0L+0T+3P

Subject Name/Code	CO Definition
CO1	Identify the functioning of various networking equipment's
CO2	Illustrate the LAN Installation techniques and Configurations techniques
CO3	Solving various Error correcting techniques and framing methods
CO4	Practice the programs for client and server involving UDP/TCP sockets using socket programming.
CO5	Estimate the communication between client and server using Network Simulator.

Tools/software: CISCO PACKET TRACER

Exp. No..	Laboratory Experiments	Technology/Tool	Description
1	Study of Different Type of LAN & Network Equipment's.	PPT Presentation along with demonstration of available Equipment's	<ul style="list-style-type: none"> Network Equipment's <ol style="list-style-type: none"> NIC card Transmission Medium Communication Mode IP Address HUB Switch Router Gateway Repeater Firewall Types of LAN- <ol style="list-style-type: none"> CANs MANs WANs.
2	LAN Installation <ul style="list-style-type: none"> State/Cross cable Basic LAN Connection Intro to Cisco Packet Tracer 	Practical Demonstration of LAN installation	<ul style="list-style-type: none"> Making LAN Cables LAN Installation with computers LAN simulation using Cisco Packet Tracer.
3	<ul style="list-style-type: none"> Study and Verification of Standard Network Topologies DHCP Server 	Understanding concept of each topology And set IP Address on Computer/Servers	<ul style="list-style-type: none"> Star Bus Ring



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			<ul style="list-style-type: none"> DHCP
4	Configure: (a) HTTP Server (b) FTP Server (c) DHCP Server (d) Telnet & SSH Service	Understanding concept of HTTP, FTP & DHCP Server. Telnet & SSH Service	<ul style="list-style-type: none"> Implementation of HTTP Server, FTP & DHCP Server And Telnet & SSH Service using Cisco Packet Tracer.
5	Troubleshooting Scenarios	Learning different networking utilities that are used for diagnosing the network problems	<ul style="list-style-type: none"> Ping command tracert command nslookup command ipconfig command ifconfig command arp command netstat command nbtstat command
6	Write a program to implement various types of error correcting techniques. Write a program to implement various types of framing methods.	Turbo C	C program <ul style="list-style-type: none"> Hamming Code .Bit Stuffing Character Stuffing
I MIDTERM EXAMINATION			
7	Default Routing Protocol	Routing Configuration Using Routing Protocol in Cisco Packet Tracer	Use Default Routing Protocol for sending Data Packet from Sender to Receiver
8	Static Routing Protocol	Routing Configuration Using Routing Protocol in Cisco Packet Tracer	Use Static Routing Protocol for sending Data Packet from Sender to Receiver
9	RIP V1 & V2 Protocol	Routing Configuration Using Routing Protocol in Cisco Packet Tracer	Use RIP Routing Protocol for sending Data Packet from Sender to Receiver



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10	EIGRP Protocol	Routing Configuration Using Routing Protocol in Cisco Packet Tracer	Use EIGRP Routing Protocol for sending Data Packet from Sender to Receiver
11.	OSPF Protocol	Routing Configuration Using Routing Protocol in Cisco Packet Tracer	Use OSPF Routing Protocol for sending Data Packet from Sender to Receiver
12	STP Protocol	Routing Configuration Using Routing Protocol in Cisco Packet Tracer	It is used to prevent layer 2 loops and broadcast storms & also used for network redundancy.

II MIDTERM EXAMINATION



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LINUX SHELL PROGRAMMING LAB 4CS4-24

LTP: 0L+0T+2P

Subject Name/Code	CO Definition
CO1	Summarize the concepts and commands in UNIX.
CO2	Construct the directory layout of a typical UNIX system, maintain, and secure UNIX directories and files.
CO3	Illustrate the knowledge to use the several shell quoting mechanism correctly.
CO4	Construct regular expression using filters and various commands to express the patterns.
CO5	Write simple scripts to develop basic command output

Tools/software: Ubuntu

Contents	Experiments
Understanding of Linux and Basic Shell Commands	<ul style="list-style-type: none"> ls, mkdir, rmdir, cd, cat, banner touch, file, wc, sort, cut, grep, dd, dfspace, du, ulimit. Cal, date, mv, echo, diff Uniq, passwd,
Understanding of Vieditor	<ul style="list-style-type: none"> To learn how to use vi editor and itsoperating keys and get editor
Shell script based on control structure	<ul style="list-style-type: none"> Greatest among three numbers. To find a year is leap year or not. To input angles of a triangle and find outwhether it is valid triangle or not. To check whether a character is alphabet,digit or special character. To calculate profit or loss. To count the number of vowels in a line oftext.
Looping- while, until,for loops	<ul style="list-style-type: none"> Write a shell script to print table of a givennumber. Write a shell script to calculate factorial of agiven number. Calculate Gross Salary from basic,DA=20% and HRA=10%
	<ul style="list-style-type: none"> Write a shell script to print sum of all evennumbers from 1 to 10. Write a shell script to print sum of digit ofany number. Write a shell script to print all even and oddnumber from 1 to 10.



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I MID TERM EXAMINATION	
	<ul style="list-style-type: none">• Write a shell script to print days of a week.• To find the sum of square of individual digits of a number.• Shell program to display student grades.
	<ul style="list-style-type: none">• Write a shell script to print starting 4 months having 31 days• To find the sum of cube of individual digits of a number.• Shell program to find the smallest number from a set of numbers
	<ul style="list-style-type: none">• Write a shell script to find a number is Armstrong or not• Write a shell script to find a number is palindrome or not.• Display of Greeting Message “Good Morning” “Good Evening”
Arrays & Shell Scripts for string Processing	<ul style="list-style-type: none">• Write a C program to read and print elements of array.• Write a C program to find sum of all array elements• Matrix Multiplication
	<ul style="list-style-type: none">• Write a C program to search elements in an Array• Write a C Program to find the sum of all numbers between 50 and 100, which are divisible by 3 and not divisible by 5
II MID TERM EXAMINATION	



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JAVA LAB 4CS4-25

LTP: 0L+0T+2P

Subject Name/Code	CO Definition
CO1	Express and restate fundamentals of java, and tools for program designing environments.
CO2	Construct classes and implement the principles of method overloading, inheritance, and access controls within those classes.
CO3	Develop Java packages and incorporate the concept of interfaces, along with importing these packages in Java.
CO4	Formulate the application by managing file operations, handling exceptions, and implementing threads.
CO5	Create applications utilizing Java applets and design various polygons. This task involves the application of knowledge and the synthesis of design skills

Tools/software: JDK 1.8

Exp. No.	Laboratory Experiments
1	Zero Lab: Installation of Java, Setting Environmental Variable
	Java Basic (Java Program Structure, Datatypes, Operators, Loop and conditional Statement)
	a) Fibonacci Series in Java
	b) Prime Number Program in Java
	c) Palindrome Program in Java
	d) Factorial Program in Java
2	e) Armstrong Number in Java
	Classes & Objects
	a) Write a Java Program to create a student class which has two data members id and name. Create the object of the student class by new keyword and printing the object's value.
	b) Write a Java Program to create Outer Class BankAcct & Inner Class Interest. Then use the variables declared in the outer class to get the output in the inner class.
	c) Write a Java Program to Find Out the Number of Objects Created of a Class.
	d) Write a Java Program to Implement the Passing and Returning Objects
3	e) Write a Java Program to Swap Objects using Swap() Method
	Arrays
	a) Write a Java Program to Find Sum and Average of All Elements in an Array
	b) Write a Java Program to Find the Frequency of All Duplicate Elements in an Array
	c) Write a Java Program to Print All Non-Repeated Elements in an Array



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	d)	Write a Java Program to Multiply Two Matrices
	e)	Write a Java Program to Separate Odd and Even Numbers from an Array
4	Functions & String	
	a)	Write a Java Program to Concatenate Two Strings
	b)	Write a Java Program to Reverse Each Word in a String
	c)	Write a Java Program to explain the concept of Callby value and Call by reference
	d)	Write a Java Program to implement recursion (factorial of a number)
	e)	Write a Java Recursive Program to Print Fibonacci Series using function
5	Method Overloading & Constructors	
	a)	Write a Java Program to Find Arithmetic Sum by Passing Argument Using Method Overloading
	b)	Write a Java Program to Find Area of Square, Rectangle and Circle using Method Overloading
	c)	Write a Java program with class named “Constructor” with three instance variables of type double: “width“, “height“, and “depth“. The class has two constructors, one without any parameters and another one with three integer parameters. The class also has a method named “volume” that calculates and returns the volume of the cuboid.
	d)	Write a Java Program to explain concept of Constructor Chaining that is the process of calling one constructor from another constructor within the same class or from the parent class.
	e)	Write a Java Program to Allocate and Initialize Super Class Members using Constructor
I MID TERM EXAMINATION		
6	Inheritance & Interface	
	a)	Write a Java Program to Use This Keyword in Inheritance Class
	b)	Write a Java Program to Use Super Keyword in Inheritance Class
	c)	Write a Java Program to Display Method Overriding in a Class using Inheritance Class
	d)	Write a Java Program to Access Super Class in a Method Overriding
	e)	Write a Java Program that Show the Implementation of Interface
	Exception Handling	
	a)	Write a Java Program for Arithmetic Exception



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7	b)	Write a Java Program for Null Pointer Exception
	c)	Write a Java Program for Number Format Exception
	d)	Write a Java Program for Array Index Out Of Bounds Exception
	e)	Write a Java Program for Exception Handling using finally block
8	Multithreading	
	a)	Write a Java program in which thread sleep for 5 sec and change the name of thread.
	b)	Write a Java program in which thread sleep for 6 sec in the loop in reverse order from 5 to 1 and change the name of thread.
	c)	Write a Java program for multithread in which user thread and thread started from main method invoked at a time each thread sleep for 1 sec.
	d)	Write a Java program for to solve producer consumer problem in which a producer produce a value and consumer consume the value before producer generate the next value.
9	e)	Write a Java program for to solve printer synchronization problem in which all the jobs must be completed in order.
	File Handling	
	a)	Write a Java program to create a file and write the text in it and save the file.
	b)	Write a Java program to read a file and display the content on screen.
	c)	Write a Java program in which data is read from one file and should be written in another file line by line
10	d)	Write a Java program to create a folder.
	e)	Write a Java program to rename a file.
	Fundamental of Applet Programming	
	a)	Write a Java program to understand Applet functionality
	b)	Write a Java Program to Create and Fill Shapes using Applet
	c)	Write a Java Program to Display Clock using Applet
	d)	Write a Java Program to Display Human Face using Applet
II MID TERM EXAMINATION		