**CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY**

FACULTY OF TECHNOLOGY AND ENGINEERING

**Devang Patel Institute of Advance Technology & Research**

Department of Computer Science & Engineering

**CE248 OPERATING SYSTEM**

Semester: IV

Academic year: 2019-20

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| **SR.**  **NO** | **AIM OF THE PRACTICAL** | **DATE** | **Pg NO** | **Remark** |
| **1** | **Working of Different Kernels:**  A. UNIX Architecture  B. Types of OS- Linux, Unix, MAC, Window etc.  C. Flavors of LINUX | 04/12 | 1 |  |
| **2** | Study of Unix Architecture and the following Unix commands with option:   |  |  | | --- | --- | | **User Access:** | login, logout, passwd, exit | | **Help:** | man, help | | **Directory:** | mkdir, rmdir, cd, pwd, ls, mv | | **Editor:** | vi, gedit, ed, sed | | **File Handling / Text Processing:** | cp, mv, rm, sort, cat, pg, lp, pr, file, find, more, cmp, diff, comm, head, tail, cut, grep, touch, tr, uniq | | **Security and Protection:** | chmod, chown, chgrp, newgrp | | **Information:** | learn, man, who, date, cal, tty, calendar, time, bc, whoami, which, hostname, history, wc | | **System Administrator:** | su or root, date, fsck, init 2, wall, shut down, mkfs, mount, unmount, dump, restor, tar, adduser, rmuser | | **Terminal:** | echo, printf, clear | | **Process:** | ps, kill, exec | | **I/O Redirection** (<, >, >>), **Pipe** ( | ), \*, gcc | | | 11/12 | 10 |  |
| **3** | 1. Write a shell script which calculatesnth Fibonacci number where n will be provided as input when prompted. 2. Write a shell script which takes one number from user and finds factorial of a given number. 3. Write a shell script to sort the number in ascending order. (Using array). | 18/12 | 27 |  |
| **4** | **Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, stat, readdir, opendir.**   1. Write a program to execute fork() and find out the process id by getpid() system call. 2. Write a program to execute following system call fork(), execl(), getpid(), exit(), wait() for a process. 3. Write a program to find out status of named file (program of working stat() system call). 4. Write a program for “ls” command implementation using opendir() & readdir() system call. | 08/01 | 30 |  |
| **5** | Process control system calls:  A. The demonstration of fork()  B. execve() and wait() system calls along with zombie and orphan states. | 22/01 | 33 |  |
| **6** | Write a C program in UNIX to implement Process scheduling algorithms and compare.  A. First Come First Serve (FCFS) Scheduling  B. Shortest-Job-First (SJF) Scheduling  C. Priority Scheduling (Non-preemption) after completion extend on Preemption.  D. Round Robin(RR) Scheduling | 05/02 | 38 |  |
| **7** | Thread management using pthread library. Write a simple program to understand it. | 12/02 | 46 |  |
| **8** | Write a C program in UNIXto implement Bankers algorithm for Deadlock Avoidance. | 19/02 | 48 |  |
| **9** | Write a C program in UNIXto perform Memory allocation algorithms and calculate Internal and External Fragmentation. (First Fit, Best Fit, Worst Fit). | 26/02 | 52 |  |
| **10** | Thread synchronization using counting semaphores and mutual exclusion using mutex. | 04/03 | 57 |  |
| **11** | Write a C program in UNIX to implement inter process communication (IPC) using Semaphore. | 11/03 | 59 |  |
| **12** | Kernel space programming: Implement and add a loadable kernel module to Linux kernel, demonstrate using insmod, lsmod and rmmod commands. A sample kernel space program should print the "Hello World" while loading the kernel module and "Goodbye World" while unloading the kernel module. | 11/03 | 62 |  |