1.1 in few lines describe what is meant by a timesharing environment. Emphasize the task of the operating system in such an environment.

\*Timesharing system are multiprogramming system supports multiple terminals, one for each active user, each user gets an impression that they have sole use of the computer

\*operating system has to dedicate some fixed amount of cpu cycle to run each user’s program

\*operating system has to store the state of the program of the user for it to switch back and run

1.2:what is multiprocessing

\*several cpus are used in a computer system to enhance the computing power

\*cpus share bus and clock sometimes they share memory and peripheral device

\*there are symmetric and asymmetric multiprocessing model

1.3what is multiprogramming

\*one cpu, different processes are ready for run

\*there exists competition between processes for resources memory, cpu

1.4:difference between multiprogramming and time sharing

\*multiprogramming is effective utilization of CPU time and I/O

\*multiprogramming makes sure the CPU always has something to do

\*while time sharing is just sharing computing time between users at the same

Time (put emphasis on interactiveness)

1.5:what is batch file? What is the default scheduling algorithm in batch processing

\*A batch file is a kind of script file in DOS, it consists of a series of commands to be executed by the command line interpreter.

\*the operating system’s job was to automatically transfer control from one job to the following one.

\*A batch system lacks interaction between user and job. The default algorithm is sequential.

1.6: what is an interrupt vector?

\*data structure that associates a list of interrupt to a list of interrupt requests

\*stores the address of an interrupt handler

1.7:What is embedded System?

\*an embedded system is a controller programed and

\*controlled by a real-time-operating-system within a larger mechanical or electrical system

\*often has computing time constraint

\*it is embed as a part of the whole complete device

\*e.g a car brake system, car air condition system, a microwave controller system

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2.1:what do you understand by a Dual-mode processor? What would be the reason for using a dual-mode processor?

\*A mode bit is added to the hardware of the computer to indicate the currently running mode

\*1 means user mode is done on behalf the user

\*0 is system mode is done on be half the OS

\*to protect the os system

\*protect one process from other user processes

2.2: give and example of synchronous interrupt and asynchronous interrupt

\*hardware interrupt, usb plugin sending signal/ software interrupt system call

\* an interrupt can be asynchronous if it is the direct result of the current instruction

\*synchronous:divide by zero, underflow, overflow

\*asynchronous: press key board, mouse, usb plugin, scheduler timer

2.3: what do you understand by a unix shell external command

\*the command interpreter in Unix is a process that runs in user mode

\*each line of shell is parsed to obtain name of command and the parameter

\*the shell of the user’s choice is run when user logs on the system.

\*the shell either waits for the process to finish, or runs the process in the ‘background’

\*user is free to ask the shell to run other programs

\*external command is not built in command for unix command interpreter program. It is usually a executable file resides in usr/bin, such as ls

2.4:describe the boot process. Mention/explain about POST and the user of MBR

\*turn on computer, CPU is started and branch to fixed location in ROM, where a set of instruction run

\*then this program begins its work as part of power on self test process. It does all the cpu memory checking and basic input-output system for errors.

\*boot sequence take over by BIOS

\*controls pass to MBR, in the first sector of hardisk has information about how and a operating system is located so that is can be loaded

\*bring on the kernel of os

2.5:give the relation and difference between a privileged instruction and a system call

\*privileged instructions are instructions that can be executed only in the monitor mode, those instruction will be

Checked by the OS

\*system call is interface between user process and os kernel.

\*system call is a subset of privileged instruction

\*privilege instruction could also be an asynchronous interrupt, I/O device needing service

\*or an instruction that does something exceptional

2.6: name real-time operating systems and give a few of their characteristic

\*RTLinux, VxWorks, windows ce

\*minimal interrups

\*minimum input

\*no virtual memory

\*minimum ram

\*most code in rom

\*a critical real-time tasks gets priority over other

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3.1: give an example of TSR processes, what is the advantage

\*Calendars , calculators, spell checkers, notepads

\*Terminate and stay resident, returns control to system if program quit, but keeps the program in memory

\*efficient if it runs often

3.2: give examples of shells. In what mode the UNIX shell runs?

C shell, Z shell, TC shell unix runs it in user mode

3.3 In what programming language is Morden UNIX written

First unix was written assembly language but now C

3.4 what are the main characteristic of modern operating systems architecture?

\*design for flexibility, often designed in module

\*kernel create message passing to communicate with different module

\*kenel talk to hardware abstract layer to talk to hardware

\*often has kernel has very small, only contains fundamental component of os

Like processor synchronization, thread scheduling

3.5 pick a version of windows mentioned in your homework and give its characteristic

\*windows NT kernel is one prominent example of a hybrid kernel

\*it is a layer design that consists of two main component, user mode and kernel mode

\*it is preemptive, reentrant operating system

\*it has been designed to work with uniprocessor and symmetric multiprocessor based computer

\*programs and subsystems in user mode are limited in terms to what system resources they have access, while kernel mode has unrestricted access

\*the architecture comprises a microkernel, Hal, drivers and executives

\*executives provide services like I/O management, Object management and security monitor, virtual memory manager

3.7 give some characteristics and responsibilities of the windows microkernel

\*the windows microkernel sits between the HAL and the executives and provides most used fundamental components of os

\*Thread scheduling, low-level processor synchronization

\*interrupt and exception handling,

\*switching between user and system modes

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4.1:what is the command that will change the shell? Why type of kernel Android uses

\*chsh

\*Android is based on the Linux kernel

4.2:what do you understand by layered structure for an operating system? What will be advantages of having such structure?

\*monolithic structure is the simplest structure, place all functionality of kernel into a single file that uses ‘

\*a single address space, no modular design

\*The OS can be broken into different layers

\*the lowers (0 layer) is the hard ware. The highest layer is user interface

\*each layer uses functions and services of lower-level only

\*easy to debug, from lower to upper

\*hard to design, inefficient

4.3 give the characteristics of win32 subsystem

\*user mode processes that enable windows to run program developed for other operating system

\*focus mainly on C

\*process 32 bit applications

4.4 are real time systems the same as embedded systems? Why or why not

\*Not quite, there could be real time embedded systems

\*embedded system describes a system that contains one or more software ware programmable devices,

But often itself is not a general purpose computer. Such system typically has fix dedicated functionality

Instead of end-user selected and load software

\*while a real-time system describes a system with deterministic low latency response to input event. they

Describe different characteristic of computer system. But they have overlap