3/1real-time processing? 1computer games2Display letters/2Difference between real-time processing? Real-time processing refers to coordinating the execution of a program with activities in the machine's environment. Interactive processing refers to a person's interaction with a program as it executes. Good real-time characteristics are needed for successful interactive processing./3Difference between time-sharing and multitasking? Time-sharing is the technique by which multitasking is accomplished on a single-processor machine./4Summarize the role of OS? *Shell*-Communicates with the machine's environment, *File manager*-Coordinates the use of the machine's mass storage, *Device drivers*-Handle communication with the machine's main memory, *Memory manager*-Coordinates the use of the machine's main memory, *Scheduler*-Coordinates the processes in the system, *Dispatcher*-Controls the assignment of processes to CPU time./5The difference between application software and utility software? Utility software performs basic, universal task, whereas application software perform tasks unique to the machine's application./6What is virtual memory? a imaginary memory space whose apparent presence is created by the process of swapping data and programs back forth between main memory and mass storage./7Booting procedure? Whe n turning on, CPU begins executing the bootstrap, which reside in ROM. This bootstrap directs the CPU through the process of transferring the operating system from mass storage into the volatile area of the main memory. When this transfer is complete, the bootstrap directs the CPU to jump to the operating system./8Difference between program and process? The program is a set of directions. A process is the action of following those directions./9The steps performed by the CPU when an interrupt occurs? CPU complete its current machine cycle, saves the state of the current process, and sets its program counter to a predetermined value. Thus the next instruction executed will be the first instruction within the interrupt handler./10If each time slice in a time-sharing system is 50 millisecond and each context switch requires at most a microsecond? If each process consumed its entire time slice, the machine could provide a complete slice to almost 20 processes in one second. If processes did not consume their entire time slices, this value could be much higher, but then the required to perform a context switch might become more significant./11If each process uses its complete in last question, What fraction of the machine's time is spent actually performing processes? What would this fraction of the machine's be if each process executed an I/O request after only a microsecond of its time slice? A total of 5000/5001 of the machine's time would be spent actually performing processes. However, when a process request an I/O activity, its time slice is terminated while the controller performs the request. Thus if each process made such a request after only one microsecond of its time slice, the efficiency of the machine would drop to 1/2. That is, the machine would spend as much time performing context switches as it would spend as much time performing context switches as it would executing processes./12Suppose process A and process B are sharing….What is a drawback to controlling access to the resource in the following manner….? This system guarantees that the resource is not used by more than one process at a time; however, it dictates that the resource be allocated in a strictly alternating fashion. Once process has used and relinquished the resource, it must wait for the other process to use the resource before the original process can access it again. This is true even if the first process needs the resource right away and the other process will not need it for some time./13Suppose a two-lane….What is the flaw in this system? If two cars enter opposite ends of the tunnel at the same time, they will not be aware of the other's presence. The process of entering and turning on the lights is another example of a critical region, or in this case we might call it a critical process. In this terminology, we could summarize the flaw by saying that cars at opposite ends of the tunnel could execute the critical process at the same time./14Suppose the following solutions have been proposed…?a. Do not let a car onto the bridge until the bridge is empty? This guarantees that the non-shareable resource is not required and allocated on a partial basis; that is, a car is given the whole bridge or nothing at all. b. If cars meet, make one of them back up? This means that the non-shareable resource can be forcibly retrieved. c. Add a second lane to the bridge? This makes the non-shareable resource shearable, which removes the competition./15Suppose we present each process in a time-sharing system…. What property of the directed graph is equivalent to deadlock in the system? A sequence of arrows that forms a closed loop in the directed graph. It is on this observation that techniques have been developed that allow some operating systems to recognize the existence of deadlock and consequently to take appropriate corrective action./16Processors in Intel's …… have four levels rather than three or five? Four is the number of different bit patterns that can be formed using two bits. If more privilege levels were required, the designers would need at least three bits to represent the different levels and would therefore probably choose to use a total of eight levels. In the same manner, the natural choice for fewer than four privilege levels would be two, which is the number of patterns that can be represented with one bit./17If the process in a time-sharing system could access memory cells outside its allotted area, how could it gain control of the machine? The process could alter the operating system program so that the dispatcher gave every time slice to that process.4/18What is an open network? An open network is one whose specifications and protocols are public, allowing different vendors to produce compatible products. /19Summarize the distinction between a repeater and a bridge? Both connect two buses to form a larger bus network. However, a repeater forwards all message whereas a bridge for the other side of the bridge./20What is a router? A router is a machine connecting two networks to form an internet. The term gateway is often used to refer to a router that connects a domain to the rest of an internet./21Identify some relationships in society that conform to the client/sever model? How about a mail order business and its clients, a bank teller and the bank's customers, or a pharmacist and his or her customers?/22Identify some protocols in society? There are numerous protocols involved in traffic flow, verbal telephone communication, and etiquette./23What is the difference between a network identifier and a host address? A network identifier identifies a domain. A host address identifies a machine within a domain. The two combined make up an IP address./24What are the components if the complete Internet address of a computer? The complete Internet address of a host consists of the network identifier and the host address./25What bit pattern is represented by 3.4.5 in….? 3.4.5 represents the three-byte pattern 000000110000010000000101. The bit pattern 0001001100010000 would be represented as 19.16 in

dotted decimal notation./26In what way is the….similar to a traditional postal address? Dose this same structure occur in IP addresses? There could be several answers to this. One is that they both progress from the specific to general. Internet address in mnemonic form begin with the name of a particular machine and progress to the name of the TLD. Postal addresses begin with the name of an individual and progress to increasingly lager regions such as city, state, and the country. This order is reversed in IP addresses, which start with the bit pattern identifying the domain.

1/27 Suppose you want to interchange….Design a sequence of steps that correctly interchanges the contents of these cells? Step 1 erases the original value in cell number 3 when the new value is written there. Constantly, step2 does not place the original value from cell number 3 in cell number 2. The result is that both cells end up with the value that was originally in cell number 2. A correct procedure is the following: Step1. Move the contents of cell number 2 to cell number 1. Step2. Move the contents of cell number 3 to cell number2. Step3. Move the contents of cell number 1 to cell number 3./28What advantage does a hard-disk….in a floppy-disk system? Faster retrieval of data and highe r transfer rates./29When recording data in a ….on another cylinder? The point to remember here is that the slowness of mechanical moti on compard with the speed of the internal functioning of the computer dictates that we minimize the number of times we must move the read/write head. If we fill a complete surface before starting the next, we must move the read/write head each time we finish with a track. The number of moves therefore is approximately the same as the total number of tracks on the two surfaces. If, however, we alternate between surfaces by electronically switching between the read/write heads, we must move the read/write head only after each cylinder has been filled./30Why should the data in a reservation….instead of a CD or DVD? In this application, information must be retrieved from mass storage in a random manner, which would be time consuming in the context of the spiral system used on CDs and DVDs/31Sometimes, when modifying a document…..the apparent size of the file by several hundred bytes. Why? Storage space is allocated in units of physical sectors. If the last physical sector is not full, additional text can be added without increasing the storage space allocated to the file. If the last physical sector is full, any addition to the document will required additional physical sectors to be allocated./32What advantage do flash drives have other mass storage systems introduced in this section? Flash drives do not require physical motion so they have shorter response times and do not suffer from physical wear. /33What is a buffer? A buffer is a data storage area used to hold data on a temporary basis, usually as a mean s of absorbing inconsistencies between the data's source and ultimate destination./34What is an advantage of representing images…..to vector techniques? As emphasized in the text, vector techniques are more conducive to changes in scale than images encoded as bit maps. For sim ple line drawings, they can also be more compact. On the other hand, vector techniques do not provide the same photographic quality that bit maps produce./35Suppose a stereo recording….capacity of a CD?635040000/36Can overflow ever occur when one positive and one negative? No, Overflow occurs when an attempt is made to store a number that is too large for the system being used. When adding a positive value to a negative value, the result must be between the values being added. Thus, if the original values are small enough to be stored, the result is also./37List four generic compression techniques?Run-length encoding, frequency-dependent encoding, relative encoding, and dictionary encoding./38What would GIF be better than JPEG when encoding color cartoons? Color cartoons consist if blocks of solid color with sharp edges. Moreover, the number of color invoked is limited. /39Suppose you were part of a team designing a spacecraft that will travel to other planets….. using GIF or JPEG's….reduce….the image? No. both GIF and JPEG are lossy compression systems, meaning that details in the image will be lost./40What characteristic of the human eye does JPEG's baseline standard exploit?JPEG's baseline standard takes advantage of the fact that the human eye is not as sensitive to changes in color as it to changes in brightness. Thus it reduce the number of bits used to present color information without noticeable loss in image quality./41What characteristic of the human ear does MP3 exploit? Temporal masking and frequency masking./42Identify a troubling phenomenon that is common when encoding numeric information, images, and sound as bit patterns? When encoding information, approximations are made. In the case of numeric data, these approximations are compounded when computations are performed, which can lead to erroneous results. Approximations are data as critical in the cases of the images and sound because the encoded data are normally only stored, transferred, and sound reproduced. If, however, images or sound were repeatedly reproduced, rerecorded, and then reencoded, these approximations could compound and ultimately lead to worthless data.

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