Shivaji University, Kolhapur
Question Bank for Mar 2022 (Summer) Examination

Subject Code: 81547, Subject Name: Operating System – II

Sr. No.	Question	A	B	C	D
1	Pool of internal data buffers are called as_____.	Memory	Free list	Buffer cache	Pool
2	A _____ is an executable file and a _____ is an instance of the program in execution.	Process, program	Page, segment	Program, process	Application, process
3	The kernel must write buffer contents to disk before reassigning the buffer this condition is called as _____.	write	delayed write	read	append
4	A buffer consists of two parts: a _____ that contains data from the disk and a _____ that identifies the buffer.	memory array, buffer header	data array, buffer index	cache array, buffer pointer	buffer header, memory array
5	A _____ is a file whose data is a sequence of entries, each consisting of an inode number and the name of a file.	Device file	File	directory	folder
6	The _____ occupies the beginning of a file system, typically the first sector, and may contain the bootstrap code that is read into the machine to boot or initialize, the operating system.	super block	boot block	data blocks	inode list
7	The _____ is responsible for process synchronization, inter-process communication, memory management, and process scheduling.	system call interface	process control subsystem	file subsystem	hardware control
8	The algorithm _____ parses the path name one component at a time, converting each component into an inode based on its name and	open	namei	write	read

	the directory being searched, and eventually returns the inode of the input path name.				
9	'ialloc' assigns _____ to a newly created file.	disk inode	disk block	byte offset	None of the above
10	Processes can use _____ system call to position the I/O and allow random access to the file.	read	creat	mknod	lseek
11	The _____ translates a file system address, consisting of a logical device number and block number, to a particular sector on the disk.	terminal driver	disk driver	device driver	stream
12	System call _____ allows a process to query the status of file, returning information such as file type, file owner, file access times, access permissions.	pipe	stat	lseek	none of the above
13	The _____ system call connects the file system in a specified section of disk to the existing file system hierarchy.	mount	link	unmount	attach
14	A process may expand or contract its virtual address space with the _____ system call.	sbrk	brk	attachreg	allocreg
15	A process can synchronize its execution with the termination of a child process by executing the _____ system call.	fork	wait	exit	close
16	When a process accesses a page that is not part of its working set, it incurs a _____ page fault.	validity	protection	invalid	file
17	The register context of a process contains _____	processor status register	stack pointer and general-purpose register	program counter	all of the above

18	Every memory location of a page is addressed by:	(Virtual page number, logical page number) pair	Virtual Page number	(Virtual page number, byte offset in page) pair	(page number, byte offset in page) pair
19	In UNIX, processes that have finished execution but have not yet had their status collected are known as _____	Sleeping processes	Stopped Processes	Zombie Processes	Orphan Processes
20	_____ is the mechanism by which virtual addresses are mapped to physical addresses.	Segmentation	Region	Paging	Memory
21	Loadreg has which of the following parameter as input:	Pointer to region table entry	Region type	Pointer to per process region table entry	Pointer to a locked region
22	A _____ is contiguous area of virtual address space of a process that can be treated as the distinct object to be shared or protected.	Process table	Region	Inode	file table
23	The collection of memory locations that the process can access is called _____	process table	process space	virtual address space	virtual space
24	After the execution of fork system call, in parent process, the pid is _____ id.	parent process	child process	Process 0	None of the above
25	Signals inform processes of the occurrences of _____	Synchronous	Asynchronous	Uni-synchronous	none of the above
26	A process can synchronize its execution with termination of child process by executing _____ system call.	exec	sleep	wait	exit
27	Logical format of _____ consists of four parts, primary headers, section headers, sections and other information.	Executable file	file inode	Process file	none of the above

28	When process executes _____ system call, kernel sets Effective User Id field in the process table and U area to the owner Id of the file.	fork	exec	setgrp	setuid
29	The scheduler of UNIX belongs to general class of operating system schedulers known as _____	Round robin	Multilevel Round robin	Round robin with multilevel feedback	Round robin feedback
30	Process can control the scheduling priority by _____ system call.	decay	nice	priority	random
31	_____ system call retrieves the cumulative times that the calling process spent executing in user mode and kernel mode.	time	times	stime	timing
32	Kernel _____ gives measure of how much time system executing in kernel and user mode and how much time it spends in executing individual routines in the kernel.	Monitoring	Accounting	Profiling	Statistics
33	The clock handler adjusts the priorities of all processes in user mode at _____ second intervals (on System V) and causes the kernel to go through the scheduling algorithm to prevent a process from monopolizing use of the CPU.	1	2	5	4
34	The _____ device is a block device in a configurable section of a disk.	secondary	page	swap	block
35	_____ have the same function as other drivers to control the transmission of data to and from terminals.	terminal driver	disk driver	device driver	stream

UNIT – I

1. Explain the architecture of UNIX System.
2. Draw and Explain Block diagram of UNIX kernel?
3. Explain with example Building Block Primitives
4. What is a buffer? Explain the structure of Buffer Header.
5. Explain an algorithm for Buffer Allocation
6. Explain the condition when Kernel wants a particular buffer and that buffer is currently busy.
7. Draw and explain Data Structures for File Subsystem
8. Explain the bread algorithm?
9. Explain the advantages & disadvantages of buffer cache?

UNIT – II

1. Explain the algorithm for conversion of pathname to Inode.
2. Explain the structure of Regular file.
3. What is super block? List and explain various fields of super block?
4. What is Inode? Summarize the fields from disk inode?
5. If the super block Free Inode list is empty and remembered Inode is 470. Explain the steps to fill the superblock free Inode list.
6. Let us assume Disk block contains 1024 bytes and there are 10 direct blocks, 1 single indirect block, 1, double indirect block, 1 triple indirect block. Find the maximum size of the file of a file's table of content. Write your own assumptions if any.
7. With the following assumption, find the block number and byte offset of the inode in the block for following inode numbers: 5153, 3015.

   Assumptions:

   i. Block size: 1024 bytes
   ii. Size of disk inode: 64 bytes
   iii. Start block of inode list: 500

8. Give the fields of in-core copy of Inode.
9. Explain iget() algorithm.
10. Explain the directories with layout example?

UNIT – III

1. Explain the dup() system call with example.
2. Explain difference between Named pipe and unnamed pipe.
3. Explain the read() system call.
4. Write short note on: Change directory and Change root.
5. Explain algorithm creat() for creating a new file.
6. Draw the file system tree before and after executing following mount() system call.

Mount("/dev/dsk1","/usr",0);

7. Explain the algorithm for mounting a file system?
8. Explain the read and write operations in the pipe?
9. Explain the algorithm for open system call to open a file?
10. Draw and explain the data structures for file system when following system calls are executed:

```
{
        fd1=open("/etc/passwd", O_RDONLY);
        fd2=open("/etc/passwd", O_WRONLY);
        fd3=open("local", O_RDONLY);
        fd4=dup(fd1);
        fd5=dup(fd4);
        close(fd1);
        close(fd3);
}
```

11. Draw and explain the file system data structures for each statement when processes (A/B) executes following system calls:

```
Process A:
fd1=open("/etc/passwd",O_RDONLY);
fd2=open("local",O_RDWR);
fd3=open("/etc/passwd",O_WRONLY);

Process B:
fd1=open("/etc/passwd",O_RDONLY);
fd2=open("private",O_RDONLY);
```

UNIT – IV

1. Draw and explain the complete process state transition diagram.
2. Write and explain algorithm for allocating a region.
3. Explain with diagram the context of a process in detail.

4. Explain with example mapping of process virtual address into physical memory address.
5. List and explain the fields of process table.
6. What is region? Describe algorithm for allocate region?
7. What is U area? List fields from the U area?
8. What is a region? Discuss mapping between per-process region table and page table.
9. Explain with example mapping of process virtual address into physical memory address.
10. Write and explain algorithm for allocating a region.
11. What is context switch? Explain the steps for Context switch.

UNIT – V

1. Explain the algorithm for exit() system call.
2. Explain different functions of clock interrupt handler
3. Explain system calls for time?
4. What is the use of fork system call? Explain the sequence of operations kernel executes for fork?
5. What is the use of signal? Explain the types of signals?
6. Explain System Boot and the Init process.
7. Draw and explain use level and kernel level priority.
8. Explain how kernel prevent a process from monopolizing the use of CPU in Unix System V.
9. Explain simple process scheduling algorithm with example.
10. Explain profiling in detail.
11. Explain process scheduling with example.

UNIT – VI

1. What is demand paging? Explain data structure used for demand paging?
2. Explain the working of page stealer process.
3. What is page fault? Explain handling of validity page fault.
4. Explain in detail allocation of space on swap device.
5. Explain the functions of line discipline and clists?
6. Explain the swapping of a process between swap space and main memory?
7. Explain the data structures for demand paging?
8. Write a short note on: Streams