

浙江大学 2005–2006 学年秋季学期

《操作系统分析及实验》课程期末考试试卷

开课学院：计算机学院、软件学院， 考试形式：有限开卷，只允许带 3 张 A4 纸入场

考试时间：_____年____月____日， 所需时间：120 分钟 教师姓名：_____

考生姓名：_____学号：_____专业：_____得分：_____

答案：

题号	答 案										得分
1–10											
11–20											
21–30											
31–40											
41–50											
51–60											
61–70											
71–80											
81–90											
91– 100											

For every following question, please select your best answer only!!!

1. UNIX is a _____ operating system.

- A.) time-sharing
 - B.) batched-processing
 - C.) uniprogramming
 - D.) real-time
2. Which is the oldest among the following OSes?
- A.) AT&T UNIX
 - B.) Solaris
 - C.) Linux
 - D.) Windows NT
3. Which of the following is able to write to standard output and files simultaneously?
- A.) tee
 - B.) |
 - C.) ||
 - D.) T
4. How do you extract the kernel from the tarball *linux-2.6.14.tar.bz2*?
- A.) tar x linux-2.6.14.tar.bz2
 - B.) untar linux-2.6.14.tar.bz2
 - C.) tar tzvf linux-2.6.14.tar.bz2
 - D.) tar xjf linux-2.6.14.tar.bz2
5. You want to install the RPM package file *foobar.rpm*. This file is located in */home/bob*. Which command would you use to install this file?
- A.) install /home/bob/foobar.rpm
 - B.) rpminst /home/bob/foobar.rpm
 - C.) rpm -i /home/bob/foobar.rpm
 - D.) instrpm /home/bob/foobar.rpm
6. What does the device file */dev/hdb6* represent?
- A.) A logical partition on a SCSI disk drive
 - B.) An extended partition on an IDE disk drive
 - C.) A primary partition on an IDE disk drive
 - D.) A logical partition on an IDE disk drive
7. Which of the following commands results in mailing the content of the current directory to Bob?
- A.) mail Bob < ls
 - B.) ls > mail Bob
 - C.) ls || mail Bob
 - D.) ls | mail Bob
8. How could you describe the following commandline? *foo; bar; foobar* ?

- A.) The commands foo, bar and foobar are processed at the same time.
 - B.) The commands foo, bar and foobar are processed one after another.
 - C.) The command foo is processed. If it results without error, then bar and foobar are processed.
 - D.) The command foo is processed. If it results without error, then bar will be processed. If bar results without error, foobar will be processed.
9. How could you watch the contents of a logfile, even if the logfile is growing while you're watching?
- A.) `tail -f logfile`
 - B.) `less -f logfile`
 - C.) `more -f logfile`
 - D.) `watch logfile`
10. Which command is able to create directory structure with cycles?
- A.) `mkdir -p`
 - B.) `md -S`
 - C.) `ln -s`
 - D.) `ln -c`
11. What is the result of the following command? `cd ~foo`
- A.) The current directory is changed to ~foo
 - B.) The current directory is changed to the home directory of the user foo
 - C.) The current directory is changed to the nearest directory with a name ending with foo
 - D.) This isn't a valid command
12. Which command is to enable owner read and write rights, group users read writes, other users no rights?
- A.) `chmod u+rw`
 - B.) `chmod 640`
 - C.) `chmod 460`
 - D.) `chmod u+rwg+rw`
13. How could you get a list of all running processes?
- A.) `ps`
 - B.) `ps ax`
 - C.) `getprocess`
 - D.) `down`
14. Which of the following commands would create a hardlink named bar using the same inode as foo?
- A.) `ln foo bar`
 - B.) `cp -l foo bar`
 - C.) `cp -d foo bar`

- D.) `ls -l foo bar`
15. How could you display all lines of text from the file `foo` which are not empty?
- A.) `grep -v ^$ foo`
 - B.) `grep -v ^\r\n foo`
 - C.) `grep -v \r\n foo`
 - D.) `grep -v "[]" foo`
16. How many primary partitions could you create with Linux on one single harddisk?
- A.) 1
 - B.) 2
 - C.) 3
 - D.) 4
17. In the bash shell, entering the `!!` command has the same effect as which one of the following?
- A.) `Ctrl-P` and Enter
 - B.) `Ctrl-U` and Enter
 - C.) `!-2`
 - D.) `!2`
18. How could you monitor the amount of free inodes on `/dev/hda3`?
- A.) `inode --free /dev/hda3`
 - B.) `ls -i /dev/hda3`
 - C.) `dm -i /dev/hda3`
 - D.) `df -i /dev/hda3`
19. How can you describe the function of the following commands: `foo | tee bar | foobar`?
- A.) The command `foo` redirects its output to the command `tee`. After that the command `bar` redirects its output to the command `foobar`
 - B.) The command `foo` writes its output to the file `tee`; the command `bar` writes its output to the file `foobar`
 - C.) The command `foo` redirects its output to the command `tee` which writes it into the file `bar` and sends the same further to the command `foobar`
 - D.) The command `foobar` gets its input from the command `bar` which gets its input from the command `foo`
20. After new Linux kernel image is built, which file need to be modified in order to use the new kernel?
- A.) `boot.conf`
 - B.) `grub.conf`
 - C.) `linux.conf`
 - D.) none of the above

21. Which option of command `gcc` enables symbolic debugging?
- A.) `-g`
 - B.) `-d`
 - C.) `-debug`
 - D.) None of the above.
22. How could you change the group membership of the file `foobar` to group `foo`?
- A.) `chown foo foobar`
 - B.) `chgrp foo foobar`
 - C.) `chgroup foo foobar`
 - D.) `chperm --group foo --file foobar`
23. What statement about the ***du***-command is true?
- A.) Dump User – backups all files owned by the named user.
 - B.) Dos Utility – provides different features to handle DOS-file systems.
 - C.) Dir User – shows the directories owned by the named user.
 - D.) Disk Usage – shows the amount of disk space used by the named directories.
24. How could you start the command ***foo*** in the background?
- A.) `bg foo`
 - B.) `background foo`
 - C.) `foo --background`
 - D.) `foo &`
25. UNIX treats I/O devices as special files, which are stored under the directory _____.
- A.) `/usr/include`
 - B.) `/bin`
 - C.) `/usr/lib`
 - D.) `/dev`
26. Which UNIX command can view a text file page by page?
- A.) `type`
 - B.) `cat`
 - C.) `dir`
 - D.) `less`
27. You've bought a new harddisk and installed it in your Linux box as master on the second IDE-channel. After partitioning it into two primary partitions and creating filesystems on both partitions, you want to ensure, that both new partitions will be mounted automatically on boot up. What is to do?
- A.) Add an entry for `/dev/hdc1` and `/dev/hdc2` to `/etc/mtab`
 - B.) Add an entry for `/dev/hdc` to `/etc/mtab`
 - C.) Add an entry for `/dev/hdc1` and `/dev/hdc2` to `/etc/fstab`

- D.) Add an entry for `/dev/hdc` to `/etc/fstab`
28. Which key combination represents EOF?
- A.) Ctrl-Z
 - B.) Ctrl-D
 - C.) Ctrl-F
 - D.) Ctrl-E
29. The LINUX operating system stores some special characters at the beginning of every file. What is the purpose of these special characters?
- A.) The size of file
 - B.) To count the number of files on the system
 - C.) To roughly indicate the type of file
 - D.) File protection
30. How could you describe the following commandline? *foo || bar*
- A.) The command `foo` redirect its output to the command `bar`.
 - B.) The command `foo` writes its output into the file `bar`.
 - C.) The command `bar` is only processed if the command `foo` leaves without error.
 - D.) The command `bar` is only processed if the command `foo` leaves with an error.
31. Before you compile your kernel, you need to configure it. Which of the following is NOT a correct way to configure?
- A.) `make config`
 - B.) `make xconfig`
 - C.) `make menuconfig`
 - D.) `make mconfig`
32. After typing ***make bzImage***, the compilation will complete server minutes later and you'll find the ***bzImage*** file in which directory?
- A.) `arch/i386/image`
 - B.) `arch/i386/boot`
 - C.) `arch/i386`
 - D.) `arch`
33. How do you get the online manual for administrative (not user) commands?
- A.) `# man 1 admin-cmd`
 - B.) `# man 2 admin-cmd`
 - C.) `# man 5 admin-cmd`
 - D.) `# man 8 admin-cmd`
34. How do you get the online manual for configuration formats?

- A.) # man 1 *some-conf*
 - B.) # man 2 *some-conf*
 - C.) # man 5 *some-conf*
 - D.) # man 8 *some-conf*
35. What command can display the contents of a binary file in a readable hexadecimal form?
- A.) xd
 - B.) hd
 - C.) od
 - D.) Xd
36. Linux dynamic link libraries end with _____.
- A.) .a
 - B.) .so
 - C.) .dll
 - D.) .exe
37. Which one of the following key sequences is used to put a process into the background to allow it to continue processing?
- A.) Ctrl-B
 - B.) Ctrl-B and then enter the bg command
 - C.) Ctrl-Z
 - D.) Ctrl-Z and then enter the bg command
38. Which one of the following statements correctly describes the > and >> symbols in the context of the bash shell?
- A.) > appends standard output to an existing file, and >> writes standard output to a new file.
 - B.) > writes standard output to a new file, and >> appends standard output to an existing file.
 - C.) > writes standard error to a new file, and >> appends standard error to an existing file.
 - D.) > pipes standard output to a new file, and >> pipes standard output to an existing file.
39. What is the first step in compiling software obtained in a compressed tar archive myapp.tgz?
- A.) make install=myapp.tgz
 - B.) make myapp
 - C.) tar xzf myapp.tgz
 - D.) tar cvf myapp.tgz
40. What does the "sticky bit" do?
- A.) It prevents files from being deleted by anyone.
 - B.) It marks files for deletion.
 - C.) It prevents files from being deleted by nonowners except root.

- D.) It prevents files from being deleted by nonowners including *root*.
41. What does the ***pr*** command do?
- A.) It prints files to the default printer.
 - B.) It displays a list of active processes.
 - C.) It modifies the execution priority of a process.
 - D.) It paginates text files.
42. The shell is simply _____.
- A.) a command-line interpreter
 - B.) a privileged program
 - C.) a GUI interface
 - D.) a set of commands.
43. Which one of the following commands would be best suited to mount a CD-ROM containing a Linux distribution, without depending on any configuration files?
- A.) `mount -f linux /dev/hdc /mnt/cdrom`
 - B.) `mount -t iso9660 /dev/cdrom /mnt/cdrom`
 - C.) `mount -t linux /dev/cdrom /mnt/cdrom`
 - D.) `e. mount -t iso9660 /mnt/cdrom /dev/cdrom`
44. System administration tasks must generally be performed by which username?
- A.) `amdin`
 - B.) `root`
 - C.) `superuser`
 - D.) `sysadmin`
45. How can you get a list of all loaded kernel modules?
- A.) `lsmod`
 - B.) `listmod`
 - C.) `modls`
 - D.) `modinfo`
46. In Unix, one process is allowed to terminate another:
- A.) Under all conditions
 - B.) Only if both processes have the same parent
 - C.) If both of the processes are running under the same `userid`
 - D.) If both processes are running the same program
47. What must be the first character on every command line in a Makefile?
- A.) space
 - B.) pound (#)
 - C.) tab
 - D.) dollar sign (\$)

48. What is the default filename of an executable file produced by gcc?
- A.) a.out
 - B.) program
 - C.) run.bat
 - D.) a.exe
49. The pipe is an example of what inter-process communication paradigm?
- A.) message passing
 - B.) file sharing
 - C.) shared memory
 - D.) smoke signals
50. User A has a file xxx and allows user B to make a symbolic link to this file. Now user A deletes the file from his directory. Which of the following options best describes what happens next?
- A.) The file gets deleted and B ends up with a invalid link
 - B.) The file remains in A's disk quota as long as B doesn't delete the link
 - C.) The file ownership is transferred and is moved into B's disk quota
 - D.) A will not be able to delete the file.
51. Which UNIX system call is used to send a signal to a process?
- A.) kill
 - B.) signal
 - C.) ioctl
 - D.) write
52. What is the term for a small integer that is used to specify an open file in a UNIX program?
- A.) file descriptor
 - B.) file pointer
 - C.) file label
 - D.) file number
53. Which of the following is not a file stream opened automatically in a UNIX program?
- A.) standard input
 - B.) standard terminal
 - C.) standard error
 - D.) standard output
54. Which system call can ask for more memory?
- A.) malloc
 - B.) calloc
 - C.) brk
 - D.) request

55. Which of these is not a possible return value for the system call: `write(fd, buffer, 256)`?
- A.) 256
 - B.) -1
 - C.) 250
 - D.) 260
56. The `dup ()` system call in LINUX comes under _____.
- A.) process system calls
 - B.) file system calls
 - C.) communications
 - D.) memory management
57. Which of these process properties is not retained when you make an `exec` system call during a running process?
- A.) process ID
 - B.) variable values
 - C.) open file descriptors
 - D.) parent's process ID
58. Which system call creates a new file?
- A.) `creat`
 - B.) `file`
 - C.) `link`
 - D.) `create`
59. Which system call creates a new process?
- A.) `read`
 - B.) `fork`
 - C.) `create`
 - D.) `exec`
60. The input parameter(s) passed INTO the pipe system call is/are:
- A.) The PID of the process to which to connect the pipe.
 - B.) A integer value representing the pipe handle and another integer value representing the capacity of the pipe.
 - C.) A pointer to an array of two integers.
 - D.) None of the above—pipe like `fork` has no parameters.
61. Which system call creates a new name for a file?
- A.) `creat`
 - B.) `file`
 - C.) `link`
 - D.) `create`

62. What is the `-c` option used for in `gcc`?
- A.) compiling multiple files into a single executable file
 - B.) creating an object file from a source file
 - C.) specifying the directory where code resides
 - D.) specifying that the language used is C
63. Which of the following performs the system call ***open***?
- A.) `system_open`
 - B.) `sys_open`
 - C.) `open_sys`
 - D.) `open_system`
64. Which of the following fields of ***struct task_struct*** contains the scheduling priority?
- A.) `int processor;`
 - B.) `int leader;`
 - C.) `unsigned long personality;`
 - D.) `long counter;`
65. Which of the following fields of ***struct task_struct*** contains the hardware context?
- A.) `struct task_struct *pidhash_next;`
 - B.) `struct task_struct **pidhash_pprev;`
 - C.) `struct thread_struct thread;`
 - D.) `struct namespace *namespace;`
66. Which of the following fields of ***struct task_struct*** contains the open-file table information?
- A.) `struct list_head local_pages;`
 - B.) `struct fs_struct *fs;`
 - C.) `struct files_struct *files;`
 - D.) `struct namespace *namespace;`
67. Which of the following structures describes a memory node (A Non-Uniform Memory Access (NUMA) consists of many banks of memory (nodes))?
- A.) `struct pglist_data;`
 - B.) `struct node_data;`
 - C.) `struct zone;`
 - D.) `struct zonelist;`
68. Which of the following structures describes the partition control block?
- A.) `struct partition;`
 - B.) `struct super_block;`
 - C.) `struct boot_block;`
 - D.) `struct inode;`
69. Which of the following structures can be called as the FCB (File Control Block)?

- A.) struct inode;
 - B.) struct pcb;
 - C.) struct file;
 - D.) struct dentry;
70. Which of the following structures describes one directory entry?
- A.) struct inode;
 - B.) struct dentry;
 - C.) struct file;
 - D.) struct dir_entry;
71. Which register contains the page directory point (for virtual memory)?
- A.) CR1
 - B.) CR2
 - C.) CR3
 - D.) CR4
72. Which of the following fields of **struct inode** describes the number of different names for one same file?
- A.) unsigned int i_count;
 - B.) nlink_t i_nlink;
 - C.) unsigned long i_no;
 - D.) off_t i_size;
73. Which of the following fields of **struct inode** describes the number of different processes using one same file?
- A.) unsigned int i_count;
 - B.) nlink_t i_nlink;
 - C.) unsigned long i_no;
 - D.) off_t i_size;
74. Which kind of structure does the **current** macro refer to?
- A.) struct task_struct
 - B.) struct mm_struct
 - C.) struct inode
 - D.) struct file
75. Which of the following scheduling policy is NOT used in the default Linux kernel?
- A.) SCHED_OTHER
 - B.) SCHED_FIFO
 - C.) SCHED_RR
 - D.) SCHED_FEEDBACK
76. Which of the following items of a hard disk partition is not cached in the Linux kernel?

- A.) boot block
 - B.) super block
 - C.) inodes
 - D.) directories
77. Which of the following functions can allocate virtual memory inside the kernel?
- A.) `alloc_page`
 - B.) `kmalloc`
 - C.) `vmalloc`
 - D.) `malloc`
78. Which of the following is most appropriate?
- A.) `sys_clone` is implemented by `sys_fork`
 - B.) `sys_fork` is implemented by `sys_vfork`
 - C.) `sys_vfork` is implemented by `sys_clone`
 - D.) `sys_fork` is implemented by `do_fork`
79. Which of the following should contain `void (*read_inode)(struct inode*)`?
- A.) `struct super_operations`
 - B.) `struct inode_operations`
 - C.) `struct file_operations`
 - D.) `struct dentry_operations`
80. When one `task_struct`'s state field is equal to `TASK_UNINTERRUPTIBLE`, it means that _____.
- A.) this task cannot be waken up
 - B.) this task can be waken up by any signal
 - C.) this task can be waken up only if an interrupt occurs and changes something in the machine state so that the task can run again.
 - D.) this task can be waken up interrupt
81. Which of the following structures should contain `loff_t (*llseek)(struct file*, loff_t, int)`?
- A.) `struct super_operations`
 - B.) `struct inode_operations`
 - C.) `struct file_operations`
 - D.) `struct dentry_operations`
82. Which of the following structures should contain `int (*link)(struct dentry*, struct inode*, struct dentry*)`?
- A.) `struct super_operations`
 - B.) `struct inode_operations`
 - C.) `struct file_operations`
 - D.) `struct dentry_operations`

83. Which of the following is the most appropriate flow for handling system call?
- A.) `system_call` → `sys_fork` → `do_fork`
 - B.) `sys_fork` → `system_call` → `do_fork`
 - C.) `sys_fork` → `do_fork` → `system_call`
 - D.) `do_fork` → `sys_fork` → `system_call`
84. Which of the following is the most appropriate for the kernel stack handling system call?
- A.) Every process has its own kernel space stack different from its user-space stack.
 - B.) Every process has its own kernel space stack which is the same as its user-space stack.
 - C.) Every process shares one common kernel space stack.
 - D.) None of the above.
85. Which of the following is correct?
- A.) Linux 2.4 kernel can be used for real-time applications.
 - B.) Linux 2.4 kernel is preemptible.
 - C.) Linux 2.6 kernel is preemptible.
 - D.) None of the above.
86. Which of the following is NOT used for describe page tables?
- A.) `pgd_t`
 - B.) `pmd_t`
 - C.) `ptd_t`
 - D.) `pte_t`
87. Which control register contains the address causing page fault?
- A.) CR1
 - B.) CR2
 - C.) CR3
 - D.) CR4
88. As for kernel synchronization mechanisms, which of the following statements is most appropriate?
- A.) `rwlock_t`
 - B.) `spinlock_t`
 - C.) semaphore
 - D.) All of the above
89. Which is the first filesystem mounted by the kernel?
- A.) `rootfs`
 - B.) `ext2`
 - C.) `ext3`
 - D.) `vfat`
90. Which is the right flow for `schedule()` inside the kernel?

- A.) goodness → prepare_switch → switch_to
 - B.) prepare_switch → switch_to → goodness
 - C.) switch_to → prepare_switch → goodness
 - D.) goodness → switch_to → prepare_switch
91. As for the interaction between a processes and its open file, which of the following is most appropriate?
- A.) A process will use the FS, beginning with **struct file**.
 - B.) A process will use the FS, beginning with **struct inode**.
 - C.) A process will use the FS, beginning with **struct dentry**.
 - D.) A process will use the FS, beginning with **struct super_block**.
92. Which of the following functions uses the slab allocator algorithm?
- A.) alloc_page
 - B.) kmalloc
 - C.) vmalloc
 - D.) malloc
93. Which of the following file-system types contains the info about the running kernel?
- A.) devpts
 - B.) tmpfs
 - C.) proc
 - D.) ext3
94. Which of the following is the system call implementation?
- A.) sys_creat
 - B.) sys_request
 - C.) sys_create
 - D.) sys_new
95. Which of the following fields of **struct ext2_inode** points to the actual file content (not metadata)?
- A.) __u32 i_blocks;
 - B.) __u16 i_links_count;
 - C.) __u32 i_block[EXT2_N_BLOCKS];
 - D.) __u32 i_faddr;
96. Which of the following is correct about one module object **modulename.o**?
- A.) It has to become the executable file **modulename** in order to use.
 - B.) It has to be used via **insmod** command
 - C.) It has to statically linked with a kernel in order to use.
 - D.) None of the above.
97. Which of the following is the right invocation flow?

- A.) `alloc_pages` → `_alloc_pages` → `__alloc_pages`
- B.) `__alloc_pages` → `_alloc_pages` → `alloc_pages`
- C.) `__alloc_pages` → `alloc_pages` → `_alloc_pages`
- D.) `alloc_pages` → `__alloc_pages` → `_alloc_pages`

98. Which of the following is correct for IPC (Inter-Process Communication)?

- A.) semaphore
- B.) shared memory
- C.) message passing
- D.) All the above

99. Which of the linkages should be used with `sys_open`?

- A.) C linkage
- B.) C++ linkage
- C.) asm linkage
- D.) none of the above.

100. Which of the following is correct?

- A.) Linux kernel uses the BIOS all the time.
- B.) Linux kernel uses the BIOS only during the booting.
- C.) Linux kernel uses the BIOS after the booting.
- D.) Linux kernel doesn't use the BIOS at all.