COURSE : DAC –FEB 2020

Subject : OS & Linux
Time: 10 to 11

Date : 5.1.2021
Duration : 1 hour

Q.No.1
modern operating systems'(like Linux and Windows) architectures were :

A) strict monolithic architectures
B) flexible monolithic architectures, along with run-time loadable modules
C) strict micro-kernel architectures
D) none of the above

Q.No.2
system call API interfaces(OS programming APIs) are provided by :

A) system libraries of OS, in user-space
B) shell of OS, in user-space
C) Java virtual machine, in user-space
D) none of the above

Q.No.3
A Process entity is :

A) an OS managed active instance of an application
B) an OS managed passive instance of an application
C) an OS managed thread of execution of an active application
D) none of the above

Q.No.4
Time-slicing cpu scheduler does one of the following :

A) allocates different time-slice/quantum values to different processes,as per internal OS algorithm
B) allocates a fixed time-slice/quantum value to every process
C) allocates time-slice/time-quantum values to processes,based on their respective priorities
D) none of the above

Q.No.5
nice value assigned to a process, using nice command has the following effect :

A) increases or decreases proportion of cpu-time share allocated to the process
B) increases or decreases real-time priority assigned to the process
C) increases or decreases physical memory allocated to the process
D) none of the above

Q.No.6
A thread entity of a process:

A) is an execution management unit of the respective process
B) is a memory resource management unit of the respective process
C) is an IO resource management unit of the respective process
D) none of the above

Q.No.7
what is the typical multitasking, sw model, for managing
several concurrent execution units, in an active application, in a modern GPOS :
A) a single thread entity, in a single process entity
B) multiple children process entities, in a single parent process entity
C) multiple thread entities, in a single process entity
D) none of the above

Q.No.8
in a modern Linux system, which of the following command will provide the version of the core/kernel of the OS :

A) echo ??
B) uname -r
C) echo $?
D) whoami

Q.No.9
which of the following is true, in a process :

A) main thread of a process is created explicitly, by a concurrent program/application code
B) main thread of a process is implicitly created, by the OS core
C) additional application threads of a concurrent program/application are implicitly created, by the OS core
D) none of the above

Q.No.10
Message-queue IPC can be used for :

A) locking critical sections of processes
B) synchronization of code blocks of processes
C) data-exchange between processes
D) all of the above

Q.No.11
a binary semaphore can be used for :

A) serializing executions of critical section code blocks of processes
B) counting resources shared by processes
C) data-exchange between processes
D) none of the above

Q.No.12
which of the following system call APIs is used to decrement a counting semaphore instance :

A) ret1 = semctl(sem_id2,0,SETALL,u1);
B) sem_id2 = semget(KEY1,3,IPC_CREAT | 0600);
C) ret1 = semctl(sem_id2,0,GETALL,u1);
D) ret2 = semop(sem_id2,&sb_array[0],1);

Q.No.13
which of the following system processes is assigned the pid(process id value) 1(one) :

A) shell's process of the first terminal
B) init's process or systemd 's process
C) first ps command's process
D) first top command's process

Q.No.14
If we load an executable program,
./while1, which of the following will be true :
Note: this while1 executable program
is generated from while1.c, containing
a simple while(1); loop

A) ./while1 will be executed, in a background process
B) ./while1 will be executed, in a foreground process
C) ./while1 will never be executed
D) none of the above

Q.No.15
in the case of an error checking posix thread mutex, what
will be the execution result, if we use the following consecutive code statements, in
a thread methodi of a threadi :

```
ret = pthread_mutex_lock(&m1) ;
ret = pthread_mutex_lock(&m1) ;
```

A) threadi's state will be changed to blocked state
B) the entire application will be dead-locked
C) threadi's second pthread_mutex_lock(&m1) will return an error code
D) a processor fault exception will be generated

Q.No.16
A shared-memory segment of a process is :

A) a special virtual address segment of the respective process' virtual address space
B) part of heap virtual memory segment of the respective process' virtual address space
C) part of data virtual address segment of the respective process' virtual address space
D) all of the above

Q.No.17
if we type an external command, in a shell instance of
a Linux Command line interface(CLI)
(like, ls or top or grep) :

A) a new, new thread is created to load and execute the external command
B) the process of the current shell instance will be used to load and execute the external command
C) a new child process is created to load and execute the external command
D) none of the above

Q.No.18
Each process is allocated :

A) an independent virtual address-space
B) a part of the system's global virtual address-space scope
C) a part of the system's global logical address-space
D) none of the above

Q.No.19
Which of the following is true :

A) semaphore operations/ system call APIs are non-atomic
B) semaphore operations/ system call APIs are atomic
C) semaphore operations/ system call APIs are strictly non-blocking
D) none of the above

Q.No.20
if we use kill -SIGSTOP <pid>, where pid(process id) is the pid of a specific target process/active application:

A) the process is normally and successfully terminated
B) the process is normally and unsuccessfully terminated
C) the process is forcibly moved to stopped state, but not terminated
D) none of the above

Q.No.21
in a page-based process memory-management model :

A) uses fixed size virtual pages, in a process virtual address-space
B) uses variable size physical pages, in physical address-space
C) uses variable size virtual pages, in a process virtual address-space
D) none of the above

Q.No.22
in the command, ps -e -o pid,vsz,rsz | less :

A) scheduling policies of processes are listed
B) scheduling priorities of processes are listed
C) active applications' sizes associated with processes are listed
D) none of the above

Q.No.23 (virtual memory)
Virtual-memory management uses swap-space of disk storage, for :

A) storing contents of active(currently, in use) virtual pages of processes
B) storing contents of inactive(currently not, in use) virtual pages of processes
C) storing contents of data files of applications
D) none of the above

Q.No.24
the command sudo <cmd> does the following :

A) executes the <cmd>, with current user's OS credentials
B) executes the <cmd>, with root user's OS credentials
C) executes the <cmd>, with very minimal OS privileges
D) none of the above

Q.No.25
which of the following is true :

A) a bash shell program is a Linux OS system utility
B) an third-party application program
C) is one of the system libraries
D) none of the above

Q.No.26
Different file system managers(file system drivers) of different file system types, in a Linux system are managed:

A) by virtual-memory manager component of the Linux kernel
B) by virtual file-system manager(VFS) component of the Linux kernel
C) by process manager component of the Linux kernel
D) none of the above

Q.No.27
if an active application(managed by a process) is waiting, for
user-input data,
what will be the state of associated process :

A) Ready state
B) stopped/suspended state
C) Running state
D) blocked/waiting state

Q.No.28
if two threads of a process are concurrently accessing a shared data, in a data-segment,
without a mutex lock mechanism :

A) there are possibilities of inconsistent data results
B) there are no possibilities of inconsistent data results, in uniprocessor systems
C) there are no possibilities of inconsistent data results, in multi-processor systems
D) none of the above

Q.No.29
which of the following is a regular file, based on ls -li command listing :

A) 899399 drwxrwxrwx 2 dac dac 4096 Sep 18 11:06 x86_32_os_info
B) 788621 -rw-rw-r-- 1 dac dac 576268 Sep 1 18:51 grub.pdf
C) 261819 lrwxrwxrwx 1 root root 8 Apr 17 2020 ypdomainname ->
hostname
D) 915714 drwx------ 15 root root 4096 Oct 30 11:53 .

Q.No.30
which of the following commands creates a new soft-link/symbolic link file :

A) ln -s x86_32_os_info x86_info
B) ln x86_32_os_info x86_info
C) mkdir x86_info
D) touch x86_info

Q.No.31
which OS IPC mechanism is used, in the following command :
$ps -e | grep -v 'bash'

A) a message queue IPC
B) a semaphore IPC
C) a pipe IPC
D) none of the above

Q.No.32
normal/regular Linux commands are found under:

A) /bin
B) /sbin
C) /etc
D) /home

Q.No.33 (Linux)
which of the following directories is the home directory of the administrator of
a Linux system :

A) /
B) /sbin
C) /root
D) /home

Q.No.34
which of the following listing commands will list all active applications executing, with root user credentials

A) ps -N -u root -o pid,ppid,cmd
B) ps -u root -o pid,ppid,cmd
C) ps -u dac -o pid,ppid,cmd
D) none of the above

Q.No.35
which of the following commands can be used to list the dynamic cpu utilization of processes/threads :

A) ps
B) top
C) free
D) stat

Q.No.36
what does chmod o+x 1_27_test1.sh do ??

A) change the execute access permission of the owner of the script file
B) change the execute access permission of all users belonging to group id of the script file
C) change the execute access permission of general users not owning the
script file and not belonging to the group id of the script file
D) none of the above

Q.No.37
which of the following commands will correctly provide the
contents of PATH environment variable of the current CLI shell :

A) cat PATH
B) cat path
C) echo $path
D) echo $PATH

Q.No.38
#!/bin/bash
taskset 0x00000001 ./w1&
taskset 0x00000001 ./w1&
taskset 0x00000001 ./w1&
taskset 0x00000001 ./w1&
taskset 0x00000001 ./w1

the above shell script will do the following :

A) launch all the w1 instances concurrently on a single processor system
B) will execute each w1 instance sequentially
C) will execute all the w1 instances in parallel on a multi-processor system
D) none of the above

Q.No.39
#!/bin/bash
taskset $2 ./$1&
taskset $2 ./$1&
taskset $2 ./$1&
taskset $2 ./$1&

in the above script, how many command line parameters
are required :

A) one
B) two
C) three
D) four

Q.No.40
#!/bin/bash

while true
do
:
done
exit

the above shell script will do the following :

A) execute one dummy loop of while and terminate normally
B) will never terminate normally
C) execute one dummy loop of while and suspend
D) none of the above