POSTAL Study Package 2019

Computer Science & IT

Objective Practice Sets

Operating System

Contents

MADE EASY Publications

1 CHAPTER
Basic Concepts of OS

Q.1 Which of the following should be allowed only in kernel mode?
1. Changing mapping from virtual to physical address.
2. Mask and unmask interrupts
3. Disabling all interrups
4. Reading status of processor
5. Reading time of day

(a) 1, 2 and 3 (b) 1, 2, 4 and 5
(c) 2, 3 and 5 (d) all of these

Q.2 An interrupt handler is a
(a) location in memory that keeps track of recently generated interrupts
(b) peripheral device
(c) utility program
(d) special numeric code that indicates the priority of a request

Q.3 Executing more than one program concurrently by one user on one computer is known as
(a) multiprogramming (b) time-sharing
(c) multitasking (d) multiprocessing

Q.4 The simultaneous processing of two or more programs by multiple processors is
(a) multitasking
(b) multiprogramming
(c) time-sharing
(d) multiprocessing

Q.5 Which of the following does not interrupt a running process?
(a) timer interrupts (b) device
(c) power failure (d) scheduling process

Q.6 System call is used to access
(a) I/O functionality
(b) operating system functionality
(c) application functionality
(d) None of the above

Q.7 Swapping is performed by
(a) long term scheduler
(b) mid term scheduler
(c) short term scheduler
(d) dispatcher

Q.8 Choose the false statement
(a) static linking requires no support of OS
(b) dynamic linking requires no support of OS
(c) dynamic loading requires no support of OS
(d) none of the above

Q.9 Assume that the kernel mode is non-preemptive. What happens when an I/O interrupt comes while a process 'P_1' is running in the kernel mode on the CPU?
(a) CPU is given to the process for which the I/O has completed
(b) CPU is given to some other process based on the scheduling policy
(c) P_1 continues to execute on the CPU
(d) None of the above

Q.10 Overlay is
(a) a part of an operating system
(b) a specific memory location
(c) a single contiguous memory that was used in the olden days for running large programs by swapping
(d) overloading the system with many user files

Q.11 When an interrupt occurs, an operating system
(a) ignores the interrupt
(b) always changes the stage of the interrupted process after processing the interrupt

(c) always resumes execution of the interrupted process after processing the interrupt
(d) may change the state of the interrupted process to "blocked" and schedule another process

Q.12 Consider the following statements:
S1: The OS is designed to maximize the resource utilization.
S2: The control program manages the system programs.

Which of the above statements is/are true?
(a) S1 is true S2 is false
(b) S2 is true and S1 is false
(c) both S1 and S2 are true
(d) both S1 and S2 are false

Q.13 Bootstrap loader is always stored in
(a) cache (b) ROM
(c) RAM (d) disk

Q.14 Which of the following is true?
(a) Overlays are used to increase the size of physical memory.
(b) Overlays are used to increase the logical address space.
(c) When overlays are used, the size of a process is not limited to the size of physical memory.
(d) Overlays are used whenever the physical address space is smaller than the logical address space.

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Answers Basic Concepts of OS

1.	(a)	2.	(c)	3.	(c)	4.	(d)	5.	(b)	6.	(b)	7.	(b)	8.	(b)	9.	(c)		
10.	(c)	11.	(d)	12.	(a)	13.	(b)	14.	(c)										

Explanations Basic Concepts of OS

1. (a)
Only critical services must reside in the kernel. All services mentioned except reading status of processors and reading time of the day are critical.
Hence option (a) is correct.

9. (c)
When the kernel is non-preemptive and any process is running in a kernel mode, then process continues to run until either it completes or it waits for some input/output.

11. (d)
When a interrupt occurs operating system decides the request on the fact that the interrupt has higher priority or less priority. If less, the interrupted process is resumed and only after the execution of process, the interrupt is handled. However if interrupt has higher priority the process is blocked and interrupt is entertained. Hence an operating system may or may not change the state of the interrupted process to "blocked" and schedule another process.

14. (c)
By using the overlays we can execute much greater processes simultaneously which cannot be execute and reside in the memory at the same time. In this the process to be executed process brought to memory only when it is needed at the time of execution.

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2 CHAPTER
Process and Threads

Q.1 Which of the following statements comparing the context of a thread with that of a process is true?
(a) two processes will not share any context; two threads of a same process will only share the data and the code (text) areas of the context
(b) two processes will not share any context; two threads of a same process will share the data, code (text) and the stack areas of the context
(c) two processes will share the data and the code (text) areas of the user context; two threads of a same process will only share the register context
(d) the overhead involved in context switching for threads is much higher than that for processes

Q.2 Which of the following information is not part of process control block
1. Process state
2. List of open files
3. Process page table
4. Stack pointer

(a) only 3 (b) 3 and 4
(c) 2 and 4 (d) None of these

Q.3 Convoy effect is a result of
(a) one long CPU bound process and many other CPU bound processes are waiting
(b) many CPU bound processes and less I/O bound processes
(c) many CPU and I/O bound processes
(d) proper mix of CPU and I/O bound processes

Q.4 In a time-sharing operating system, when the time slot given to a process is completed, the process goes from the RUNNING state to the
(a) BLOCKED state
(b) READY state
(c) SUSPENDED state
(d) TERMINATED state

Q.5 In a multiprogramming environment
(a) the processor executes more than one process at a time
(b) the programs are developed by more than one person
(c) more than one process resides in the memory
(d) a single user can execute many programs at the same time

Q.6 If a system contains n processors and n processes then what will be maximum and minimum processes in running state respectively.
(a) n, n (b) n, 0
(c) n^2, 0 (d) n^2, n^2

Q.7 Match **List-I** with **List-II** select the correct answer using the codes given below the lists:

List-I
A. run → ready
B. run → blocked
C. blocked → run
D. run → terminated

List-II
1. not possible
2. when a process terminates itself
3. when a process time quantum expires
4. when a process issues an input / output request

Codes:

	A	B	C	D
(a)	1	4	3	2
(b)	2	1	3	4
(c)	3	4	1	2
(d)	1	4	2	3

Q.8 While designing a kernel, an operating system designer must decide whether to support kernel-level or user-level threading. Which of the following statements is/are true?

1. Kernel-level threading may be preferable to user-level threading because storing information about user-level threads in the process control block would create a security risk.
2. User-level threading may be preferable to kernel-level threading because in user-level threading, if one thread blocks on I/O, the process can continue.

(a) 1 only (b) 2 only
(c) 1 and 2 only (d) None of these

Q.9 Consider the following statements with respect to user-level threads and kernel-supported threads

(*i*) Context switching is faster with kernel-supported threads
(*ii*) For user-level threads, a system call can block the entire process
(*iii*) Kernel-supported threads can be scheduled independently
(*iv*) User-level threads are transparent to the kernel

Which of the above statements are true?
(a) (*ii*), (*iii*) and (*iv*) only
(b) (*ii*) and (*iii*) only
(c) (*i*) and (*iii*) only
(d) (*i*) and (*ii*) only

Q.10 Assume process A has 3 user level threads and process B has 4 kernel-level threads. Consider while process A is running in CPU, process B is waiting in ready queue. If one of the thread in A is blocked then find status of A threads and B threads?
(a) All A threads are blocked and all B threads are blocked
(b) All A threads are blocked and B threads are not blocked
(c) All B threads are blocked and A threads are not blocked
(d) None of these

Q.11 Assume T_1 and T_2 are two threads of the same process. Consider the following information:
1. Data section
2. Stack section
3. Code section
4. I/O files

Find which of the above information can be shared by T_1 and T_2.
(a) 1, 2, 3 (b) 1, 2, 4
(c) 1, 3, 4 (d) 2, 3, 4

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Answers Process and Threads

1. (a) 2. (d) 3. (a) 4. (b) 5. (c) 6. (b) 7. (c) 8. (a) 9. (b)
10. (b) 11. (c)

Explanations Process and Threads

3. **(a)**
CPU bound processes requires lot of processor time, resulting in long wait for I/O bound processes for the processor. This effect is called convey effect. It results in lower CPU and I/O devices utilization.

6. **(b)**
When system contains '*n*' processor and '*n*' processes, then maximum number of processes in running state can be 'n' with each processor containing maximum of one process in the running state. The minimum number is zero with no processor having a process in running state.
hence correct option (b).

7. **(c)**
When a process issues an input/output request then it goes from running state to blocked state. When a process terminates itself it goes from running state to terminate state.
A process cannot go to running state after completing its I/0, it most go to ready state.
Hence option (c) is correct.

9. **(b)**
Kernel level threads can be scheduled independently. For user level threads a system call can block the entire process and are not transparent to kernel.

10. **(b)**
Process A has user-level threads. Whole process has single control block instead of maintaining control block for each thread. So blocking one thread cause all processes to block. Here process *A* and process *B* are independent, hence no relation between *A* and *B*.
$\therefore$ Option (b) is correct.

11. **(c)**
Each thread needs a program counter and stack section to keep the local variables of procedures. So stack section can not be shared by threads.
$\therefore$ option (c) is correct.

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