**Chapter 4 – Threads**

**TRUE/FALSE QUESTIONS:**

T F 1)  The OS performs a protection function to prevent unwanted interference

between processes with respect to resources.

T F 2)  Windows process design is driven by the need to provide support for a

variety of OS environments.

T F 3)  The unit of dispatching is usually referred to as a process or task.

T F 4)  In a multithreaded environment there are separate stacks for each thread,

as well as a separate control block for each thread.

T F 5)  It takes less time to terminate a process than a thread.

T F 6)  If there is an application or function that should be implemented as a set of

related units of execution, it is far more efficient to do so as a collection of

separate processes rather than a collection of threads.

T F 7)  An example of an application that could make use of threads is a file server.

T F 8)  Termination of a process does not terminate all threads within that process.

T F 9)  If a process is swapped out, all of its threads are necessarily swapped out

because they all share the address space of the process.

T F 10)  On a uniprocessor, multiprogramming does not enable the interleaving

of multiple threads within multiple processes.

T F 11)  Any alteration of a resource by one thread affects the environment of the

other threads in the same process.

T F 12)  In a pure ULT facility, all of the work of thread management is done by

the application, and the kernel is not aware of the existence of threads.

T F 13)  As a default, the kernel dispatcher uses the policy of hard affinity in

assigning threads to processors.

T F 14)  Windows is an example of a kernel-level thread approach.

T F 15)  The potential performance benefits of a multicore organization depend on

the ability to effectively exploit the parallel resources available to the application.

**MULTIPLE CHOICE QUESTIONS:**

1. The traditional approach of a single thread of execution per process, in which the concept of

a thread is not recognized, is referred to as a \_\_\_\_\_\_\_\_\_\_ .

A)  task   B)  resource

C)  single-threaded approach   D)  lightweight process

1. The idea of having a many-to-many relationship between threads and processes has been

explored in the experimental operating system \_\_\_\_\_\_\_\_\_ .

A)  VISTA   B)  TRIX

C)  SOLARIS   D)  LEOPARD

1. In a multithreaded environment, a \_\_\_\_\_\_\_\_\_\_ is defined as the unit of resource allocation and

a unit of protection.

A)  strand   B)  process

C)  string   D)  trace

1. The principal disadvantage of the \_\_\_\_\_\_\_\_\_ approach is that the transfer of control from one

thread to another within the same process requires a mode switch to the kernel.

A)  KLT   B)  LWP

C)  VAX   D)  ULT

5)  \_\_\_\_\_\_\_\_\_ is a good example of an OS using a combined ULT/KLT approach.

A)  TRIX   B)  Windows

C)  LINUX   D)  Solaris

6) A \_\_\_\_\_\_\_\_\_ is a single execution path with an execution stack, processor state, and scheduling

information.

A)  domain   B)  strand

C)  thread   D)  message

7)  \_\_\_\_\_\_\_\_\_\_ are characterized by the presence of many single-threaded processes.

A)  Multiprocess applications   B)  Java applications

C)  Multiinstance applications   D)  Multithreaded native applications

8)  A \_\_\_\_\_\_\_\_\_\_ is a dispatchable unit of work that executes sequentially and is interruptible

so that the processor can turn to another thread.

A)  port   B)  process

C)  token   D)  thread

9)  A \_\_\_\_\_\_\_\_\_\_ is an entity corresponding to a user job or application that owns resources

such as memory and open files.

A)  task   B)  process

C)  thread   D)  token

10)  A \_\_\_\_\_\_\_\_ is a user-created unit of execution within a process.

A)  Kernel   B)  KLT

C)  lightweight process   D)  ULT

11)  A Windows process must contain at least \_\_\_\_\_\_\_\_\_ thread(s) to execute.

A)  four   B)  three

C)  two   D)  one

12)  A thread enters the \_\_\_\_\_\_\_\_\_ state, after waiting, if it is ready to run but the

resources are not available.

A)  Terminated   B)  Standby

C)  Transition   D)  Waiting

13)  The \_\_\_\_\_\_\_\_\_ are the fundamental entities that can be scheduled and dispatched

to run on one of the system processors.

A)  Processes   B)  Kernel threads

C)  LWPs   D)  ULTs

14)  The \_\_\_\_\_\_\_\_\_\_ state is when the thread has terminated.

A)  ZOMBIE   B)  FREE

C)  STOP   D)  SLEEP

15)  The blocked state in which the process is waiting for an event, such as the end of

an I/O operation, the availability of a resource, or a signal from another process,

is the \_\_\_\_\_\_\_\_\_ state.

A)  Times and timers   B)  Uninterruptible

C)  Stopped   D)  Interruptible

**SHORT ANSWER QUESTIONS:**

1. The \_\_\_\_\_\_\_\_\_\_ is the collection of program, data, stack, and attributes defined in

the process control block.

1. \_\_\_\_\_\_\_\_\_\_ refers to the ability of an OS to support multiple, concurrent paths of

execution within a single process.

1. The key states for a thread are: Running, \_\_\_\_\_\_\_\_\_, and Blocked.
2. There are four basic thread operations associated with a change in thread state:

Block, Unblock, Finish, and \_\_\_\_\_\_\_\_\_ .

1. There are two broad categories of thread implementation: user-level threads (ULTs) and \_\_\_\_\_\_\_\_.
2. A way to overcome the problem of blocking threads is to use a technology referred to

as \_\_\_\_\_\_\_\_\_\_ , which converts a blocking system call into a nonblocking system call.

1. A \_\_\_\_\_\_\_\_\_\_ is a static entity, consisting of an address space and ports through which

messages may be sent and received.

1. Windows makes use of two types of process-related objects: processes and \_\_\_\_\_\_\_\_\_ .
2. The \_\_\_\_\_\_\_\_\_\_ Windows Process Object Attribute describes who created an object,

who can gain access to or use the object, and who is denied access to the object.

1. The six states of a Windows thread are: Ready, Standby, Running, Waiting, Transition,

and \_\_\_\_\_\_\_\_\_ .

1. Most operating systems contain two fundamental forms of concurrent activity:

processes and \_\_\_\_\_\_\_\_\_ .

12) A process or task in Linux is represented by a \_\_\_\_\_\_\_\_\_\_ data structure.

13) The Clouds operating system implements the concept of a thread as primarily an

entity that can move among address spaces which represents the \_\_\_\_\_\_\_\_\_\_

Thread-to-Process relationship.

14)  It is necessary to \_\_\_\_\_\_\_\_\_\_ the activities of various threads so they do not interfere

with each other or corrupt data structures.

15) The basic form of communication between processes or threads in a microkernel

operating system is \_\_\_\_\_\_\_\_\_ .