University of Sargodha

BS 5th Term Exam 2017

Subject: Computer Science **Course: Operating System (CS:3621)**

Time Allowed: 2:30 Hours **Maximum Marks: 60**

Objective Part Compulsory

Q.No.1: Attempt all parts and each require answer 2 – 3 line (12*2=24)

i. What is system call to create child process?

system call fork () is used to create processes. It takes no arguments and returns a process ID. The purpose of fork () is to create a new process, which becomes the child processor of the caller. After a new child process is created, both processes will execute the next instruction following the fork () system call.

ii. Process Control Block.

Process Control Block (PCB, also called Task Controlling Block, Entry of the Process Table, Task Struct, or Switch frame) is a data structure in the operating system kernel containing the information needed to manage the scheduling of a particular process.

iii. Race conditions.

A race condition is an undesirable situation that occurs when a device or system attempts to perform two or more operations at the same time, but because of the nature of the device or system, the operations must be done in the proper sequence to be done correctly.

iv. Define Demand Paging.

In virtual memory systems, demand paging is a type of swapping in which pages of data are not copied from disk to RAM until they are needed.

v. Busy Waiting.

Busy-waiting, busy-looping or spinning is a technique in which a process repeatedly checks to see if a condition is true, such as whether keyboard input or a lock is available.

vi. Define file system.

A file system typically manages operations, such as storage management, file naming, directories/folders, metadata, access rules and privileges.

vii. User mode and Kernel mode

In Kernel mode, the executing code has complete and unrestricted access to the underlying hardware. In User mode, the executing code has no ability to directly access hardware or reference memory.

viii. List four conditions of deadlock.

Deadlock occurs if the following four conditions take place simultaneously in a system:

1. Mutual exclusion
2. Hold and wait
3. No preemption
4. Circular wait

ix. Text segment and data segment.

The Text segment contains the executable program code and constant data. The text segment is marked by the operating system as read-only and cannot be modified by the process. A data segment is a portion of virtual address space of a program, which contains the global variables and static variables that are initialized by the programmer.

x. What are various types of fragmentation?

There are three different but related forms of fragmentation: external fragmentation, internal fragmentation, and data fragmentation, which can be present in isolation or conjunction.

xi. Define two phase locking.

Two-phase locking (2PL) is a concurrency control method that guarantees serializability. It is also the name of the resulting set of database transaction schedules (histories).

xii. Mutual Exclusion.

Mutual Exclusion is a process that prevents multiple threads or processes from accessing shared resources at the same time. The problem is coming from the fact that in both distributed systems and single system, several threads or processes share a resource but cannot use it concurrently.

xiii. What is demand paging.

In virtual memory systems, demand paging is a type of swapping in which pages of data are not copied from disk to RAM until they are needed.

xiv. Context Switching.

A context switch is a procedure that a computer's CPU (central processing unit) follows to change from one task (or process) to another while ensuring that the tasks do not conflict. Effective context switching is critical if a computer is to provide user-friendly multitasking.

xv. Mention any four file attributes.

Archive, hidden, read-only and system.

xvi. Explain the terms: Waiting time, Turnaround time.

Turnaround time is Time Difference between completion time and arrival time.

Turn-Around Time = Completion Time – Arrival Time.

Waiting time is the time difference between turnaround time and burst time.

Waiting time = Turn-around time – Burst time.

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