King Saud University
College of Computer and Information Sciences
Department Of Computer Science
Summer Term 1437-1438
CSC 227:Operating Systems Mid-1
Date: 6-11-1438H (27-7-2017G)
Time: 4:00 to 6:00 PM

جامعة الملك سعود
King Saud University 1957

Student Name [redacted] **Student Number** [redacted]

Q1. (10 marks) Put a circle around the best answer for each of the following

16.5/20

1. **When DMA is used, an interrupt is generated per**
   a. Bit
   b. Byte
   c. Block (c)
   d. Kilobyte
2. **Which of the following orders the storage devices from fastest to slowest**
   a. Registers, cache, main memory, solid state disks, hard disks, magnetic tapes, optical disk (a)
   b. Registers, cache, main memory, solid state disks, hard disks, optical disk, magnetic tapes
   c. Registers, cache, solid state disks, main memory, hard disks, magnetic tapes, optical disk
   d. Registers, cache, solid state disks, main memory, optical disk, hard disks, magnetic tapes
3. **Division by zero generates**
   a. A trap (a)
   b. An interrupt
   c. A swap
   d. None of the above
4. **Which of the following is not an advantage of multiprocessor systems**
   a. Increased throughput (c)
   b. Increased reliability
   c. Increased security
   d. Both b & c
5. **Parameters can be passed to the operating system during a system call by** (d)
   a. Pushing the parameters onto a stack
   b. Using CPU registers
   c. Using a block or table in memory
   d. All of the above
6. **The inter-process communication method that avoids conflict is** (a)
   a. message passing
   b. shared memory
   c. all of the above
   d. none of the above

message passing

8 + 3 + 5 = 16.5

7. **Which of the following operating system structures is the most difficult to implement and maintain**
   a. the monolithic structure
   b. the layered structure
   c. micro-kernel
   d. the modular structure
8. **Which of the following operating system structures requires the least communication overhead between its components**
   a. the monolithic structure
   b. the layered structure
   c. micro-kernel
   d. the modular structure
9. **One of the following is not an advantage of a micro-kernel operating system**
   a. Easy to extend
   b. Easy to port to a new architectures
   c. Efficient because it has no communication overhead
   d. reliable
10. **CPU scheduling decisions may take place when a process**
   a. Switches from running to waiting state
   b. Switches from running to ready state
   c. Switches from waiting to ready
   d. All of the above
11. **The fork system call returns ..... for the child process:**
   a. The PID of the parent
   b. -1
   c. 0
   d. 1
12. **The multiprogramming degree refers to**
   a. Number of jobs in the ready queue
   b. Number of I/O bound processes in the ready queue
   c. Number of CPU-bound processes queue
   d. Number of jobs in the job queue
13. **If a fork system call fails to create a child process it returns**
   a. 0
   b. A negative value
   c. A positive value
   d. Nothing
14. **A Medium-term scheduler may be used to**
   a. Decrease the degree of multiple programming
   b. Improve the mix of CPU bound and I/O bound processes
   c. Free memory
   d. All of the above
15. **A PCB does not contain**
   a. Process state
   b. the time CPU used
   c. contents of all process-centric registers
   d. it contains all of the above

Q3. (6 marks) Briefly answer the following questions:

a. What is the main advantage of using a shared memory for inter-process communication? (1 mark)

* it is faster.

b. What is the main drawback of using a shared memory for inter-process communication? (1 mark)

The drawback of shared memory is difficult.

c. What do we mean by CPU bound and I/O bound processes? Why it is important to differentiate between them? (1.5 marks)

CPU bound:

takes more time in computation than I/O device

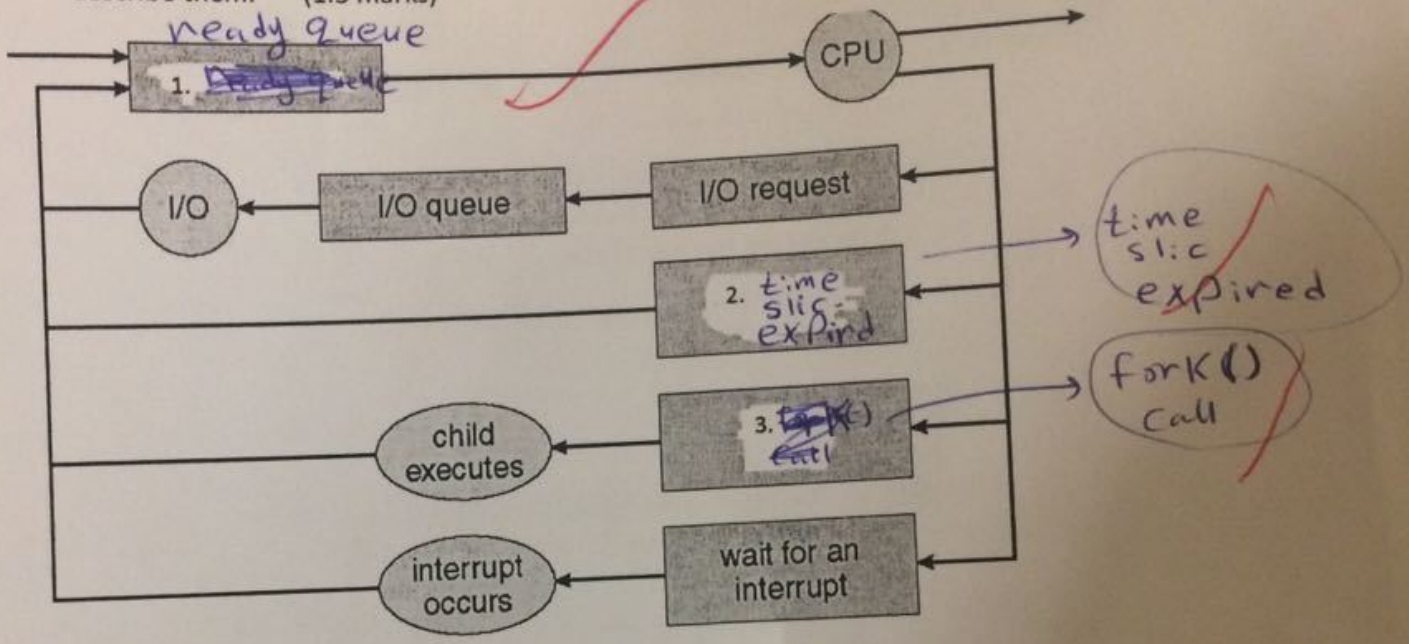
I/O bound:

takes more time in I/O device than computation

Reason to differentiate between them?

cpu bound related to cpu and I/O bound related to I/O device and reason to divide works of process

d. In the following queuing diagram, fill in the blank boxes with a few words that best describe them. (1.5 marks)



e. In the following diagram, fill the blank boxes with the correct state of the process (1.5 marks)