

**Started on** Thursday, 17 February 2022, 4:37 PM

**State** Finished

**Completed on** Thursday, 17 February 2022, 5:30 PM

**Time taken** 52 mins 9 secs

**Grade** 42.00 out of 50.00 (84%)

Information

**The theory part of this exam uses sequential navigation when presenting the questions. Therefore, questions must be answered the moment they are presented, as you will not have the option of going back to a previous question.**

**After the theory part, two programming questions will be presented.**

**True or False questions (2 points each question)**

Question **1**

Correct

Mark 2.00 out of 2.00

Cache memory is visible to the operating system.

Select one:

- ☐ True
- ☒ False ✓

Question **2**

Correct

Mark 2.00 out of 2.00

An arithmetic overflow instruction generates a program interrupt.

Select one:

- ☒ True ✓
- ☐ False

Question **3**

Correct

Mark 2.00 out of 2.00

The principal objective of multiprogramming is to maximize processor utilization.

Select one:

- ☒ True ✓
- ☐ False

Question **4**

Correct

Mark 2.00 out of 2.00

The principal objective of time sharing is to increase the average response time.

Select one:

- ☐ True
- ☒ False ✓

Question **5**

Correct

Mark 2.00 out of 2.00

Suspended processes are available in the main memory to be executed.

Select one:

- ☐ True
- ☒ False ✓

Question **6**

Correct

Mark 2.00 out of 2.00

In the five-state process model, multiple blocked queues will improve the performance of the system.

Select one:

- ☒ True ✓
- ☐ False


Question **7**

Incorrect

Mark 0.00 out of 2.00

In a multithreaded process, the process control block has information about the state of the threads (ready, running, etc.).

Select one:

- ☒ True 
- ☐ False


Question **8**

Correct

Mark 2.00 out of 2.00

In a User-Level Thread implementation, the scheduling at the OS level is based on threads.

Select one:

- ☐ True
- ☒ False 

Information

## Simple Choice questions (4 points each question)


Question **9**

Correct

Mark 4.00 out of 4.00

Select the I/O technique that does not use the processor to the transfer of information between the I/O device and main memory:

Select one:

- ☐ a. Programmed I/O
- ☐ b. Interrupt Driven I/O
- ☐ c. None of the Above
- ☒ d. DMA 

Question **10**

Correct

Mark 4.00 out of 4.00

Select the best approach for a system with multiple processes from multiple users:

Select one:

- ☐ a. Multiprogramming
- ☐ b. None of the above
- ☐ c. Uniprogramming
- ☒ d. Time Sharing ✓

Question **11**

Correct

Mark 4.00 out of 4.00

Select the transition that is invalid for the five-state process model with two suspend states:

Select one:

- ☐ a. Ready/suspend -> Ready
- ☐ b. None of the above
- ☐ c. Running -> Blocked
- ☐ d. Ready -> Running
- ☒ e. Ready/suspend -> Running ✓

Question **12**

Correct

Mark 4.00 out of 4.00

Select an advantage of kernel-level threads:

Select one:

- ☐ a. Scheduling can be application specific
- ☐ b. None of the Above
- ☐ c. Threads functions are done in user mode
- ☐ d. Uses a thread library
- ☒ e. Can take advantage of a multiprocessor platform ✓

**Calculate the following parameters of a hypothetical computer system with these features:**

- a) HEX notation
- b)  $IR = \text{OPCode} + \text{Mem Addr}$ ;
- c) # of OPCODEs = 256
- d) PC = 6 HEX digits; and
- e) Mem word size = Data (unsigned integer) = IR

Note: do not enter the unit when writing your answer.

**Question 13**

Correct

Mark 6.00 out of 6.00

Size of the IR in bits.

Answer:

**Given the following two-level memory system:**

- Level 1 memory access time = TL1
- Level 2 memory access time = TL2
- Average time to access a word from mem = 1100 ms
- $TL2 = 100 \cdot TL1$
- Hit Rate = 0.9 (90 %)
- Time to find a word in any level of the memory (0 ms).
- Do not enter the unit when writing your answer.

Calculate:

Question **14**

Correct

Mark 6.00 out of 6.00

TL1:

Answer: Question **15**

Incorrect

Mark 0.00 out of 6.00

Given the following code:

```
void * func(void * pointer)
{
    int *int_ptr = (int *) pointer;
    for(int i = 0; i < 10; i++)
        if (i % 2 != 0 )
            *int_ptr = *int_ptr + 2;
    return NULL;
}
int main()
{
    static int x = 0 ;
    pthread_t tid;
    pthread_create(&tid, NULL, func, (void *) &x);
    pthread_join (tid, NULL);
    printf ("X = %d\n", x);
    return 0;
}
```

Enter the value of the variable x for the instruction `printf("X = %d\n", x);`:Answer: [◀ Announcements](#)[Programming Question 1 ▶](#)