CSE - 5114

I SEMESTER M.TECH.(DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING) END SEMESTER EXAMINATIONS, DEC 2023 SUBJECT: ADVANCED SYSTEM SOFTWARE (CSE - 5114)

ANIPAL INSTITUTE OF TECHNOLOGY

REVISED CREDIT SYSTEM

(02/12/2023)

Time: 9:30 am to 12:30 pm

MANIPAL

MAX.MARKS: 50

INSTRUCTIONS TO CANDIDATES:-

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

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1A. The Figure 1 belongs to which descriptor? Illustrate the 5M CO1 2 fields present in the descriptor and describe how it is different from other descriptor.

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BASE (0 -15)						LIMIT (0 - 15)				

Figure	1
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- 1B. Describe with a neat diagram, how to store a 3M CO1 2 process descriptor.
- Discuss the features of kernel memory allocator that 2M CO1 2 tries to satisfy requests for memory areas from all the parts of the system.
- 2A. Outline the operations which is performed by 4M CO1 3 executing a single assembly language instruction without being interrupted in the middle. Illustrate the classification that need to be addressed for the assembly language instruction.
- 2B. Describe how does the scheduling algorithm divides 3M CO2 4 the CPU time into epochs.

- 2C. Identify which functions are used to access the process 3M CO2 2 address space in kernel mode. Illustrate.
- 3A. Full slab precede partially full slab that precede empty 4M CO2 3 slab. Illustrate with a neat diagram. Also illustrate the possible ways to store an object descriptor of a slab.
- 3B. Describe the different types of objects addressed in 4M CO2 2 common file model.
- 3C. Describe the buddy system algorithm with a simple 2M CO2 2 example.
- 4A. With a neat diagram, discuss the split view of the kernel 5M CO3 2 in detail.
- 4B. Scullc is a cut-down version of the scull module that 3M CO3 3 implements only the bare device. Unlike scull, which uses kmalloc, scullc uses memory caches. The size of the quantum can be modified at compile time and at load time, but not at runtime—that would require creating a new memory cache, and we didn't want to deal with these unneeded details.

Illustrate the technique used to solve this scenario.

- 4C. Show a neat diagram for the peripheral interface for 2M CO3 2 running digital I/O sample code on a computer.
- 5A. Imagine for a moment that your driver acquires a 5M CO3 3 spinlockand goes about its business within its critical section. Somewhere in the middle, your driver loses the processor. Perhaps it has called a function that puts the process to sleep. Or, perhaps, kernel preemption kicks in, and a higher-priority process pushesyour code aside. Your code is now holding a lock that it will not release any time inthe foreseeable future. If some other thread tries to obtain the same lock, it will, in the best case, wait (spinning in the processor) for a very long time. In the worst case, the system could deadlock entirely.

Analyze the given scenario and discuss which technique is used to resolve it.

- 5B. Describe the concept of logic programming model.3MCO42
- 5C. Distinguish between parallel and distributed computing. 2M CO5 2