I SEMESTER M.TECH.(DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING) END SEMESTER EXAMINATIONS, DEC 2023

SUBJECT: ADVANCED SYSTEM SOFTWARE (CSE - 5114)

REVISED CREDIT SYSTEM

23091300 8

(02/12/2023)

Time: 9:30 am to 12:30 pm   MAX.MARKS: 50

INSTRUCTIONS TO CANDIDATES: -

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

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

BASE (24-31)	G	D	O	AVL	LIMIT (16-19)	1	DPL	S = 1	TYPE	BASE (16-23)
BASE (0 -15)						LIMIT (0 - 15)				

Figure 1

		Marks
1B.	Describe with a neat diagram, how to store a process descriptor.	3M
1C.	Discuss the features of kernel memory allocator that tries to satisfy requests for memory areas from all the parts of the system.	2M
2A.	Outline the operations which is performed by 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.	4M
2B.	Describe how does the scheduling algorithm divides the CPU time into epochs.	3M
2C.	Identify which functions are used to access the process address space in kernel mode. Illustrate.	3M

3A.	Full slab precedes partially full slab that precede empty slab. Illustrate with a neat diagram. Also illustrate the possible ways to store an object descriptor of a slab.	4M
3B.	Describe the different types of objects addressed in common file model.	4M
3C.	Describe the buddy system algorithm with a simple example.	2M
4A.	With a neat diagram, discuss the split view of the kernel in detail.	5M
4B.	Scullc is a cut-down version of the scull module that 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.	3M
4C.	Show a neat diagram for the peripheral interface for running digital I/O sample code on a computer.	2M
5A.	Imagine for a moment that your driver acquires a spinlock and 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 pushes your code aside. Your code is now holding a lock that it will not release any time in the 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.	5M
5B.	Describe the concept of logic programming model.	3M
5C.	Distinguish between parallel and distributed computing.	2M