MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

I SEMESTER M.TECH. (CSE) MIDSEMESTER EXAMINATION

SUBJECT: CSE – 5114 ADVANCED SYSTEM SOFTWARE

Time: 10:00 AM – 11:30 AM Date: 09/10/2024 MAX.MARKS: 30

Note:

- Answer all the questions
- Missing data may be assumed suitably

		Marks
1A.	Discuss the different ways to activate a kernel routine. Illustrate the interfacing of device drivers with the rest of the kernel and with the processes.	3M
1B.	Describe the paging unit of Intel processors that handles 4KB pages. Outline each field entries of page directories and page tables.	5M
1C.	After context switch, what happens to the value and address of the *esp* register in the process kernel stack. Justify with valid answer.	2M
2A.	Resources owned by the parent process are duplicated, and a copy is granted to the child process. This approach makes process creation very slow and inefficient, since it requires copying the entire address space of the parent process. The child process rarely needs to read or modify all the resources already owned by the parent, in many cases, it issues an immediate *execve( )* and wipes out the address space. Analyze and provide the solution. Describe the parameters used in *__clone()* system call.	3M
2B.	Illustrate the use of data structures introduced by the buddy system algorithm. Support your answer with the help of an example.	3M
2C.	Analyze the quantum duration of a process in relation to system performance. Discuss the values permitted in the policy field of the scheduling class.	4M
3A.	Can you explain the implementations of different functions when a process wishes to acquire a kernel semaphore lock.	3M
3B.	Outline the ways a module author turns source code into an executing subsystem within the kernel.	3M
3C.	A module is said to belong to a specific class according to the functionality it offers. Support the statement by depicting the different classes of modules in charge of specific tasks.	4M