VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

School of Computer Science and Engineering
Fall Semester 2023-2024
Continuous Assessment Test – 1

SLOT: B1+TB1, B2+TB2

Programme Name & Branch: B.Tech & BCB, BCE, BCI, BCT, BDS, BKT
Course Name & Code: Operating Systems & BCSE303L
Exam Duration: 90 Mins. **Maximum Marks: 50**

Q.No.	Question	Max Marks
1.	Describe the various methods used for operating system Structure. Also discuss the advantages and disadvantages of each structuring method.	10
2.	a) What is a system call? Why are system calls necessary? Illustrate the methods to pass the parameters of system calls to the OS.	5
	b) Categorize the following instructions into privileged instructions and non-privileged instructions. Also mention whether the instruction to be executed under user mode or kernel mode. i) Reading system time ii) Clear Memory iii) Opening and reading a file iv) Set the timer v) Performing arithmetic operation	5
3.	What are the differences between user-level threads and kernel-level threads? Mention the advantages of using multithreaded programming in multicore architecture systems. Also illustrate the different multi-threading models.	10
4.	Consider a system with five processes (P1, P2, P3, P4, P5), all arriving at time zero, with total execution time (includes CPU Burst time and I/O Burst time) of 25, 15, 20, 10 and 5 milliseconds respectively. Each process spends 20% of execution time doing I/O and 80% of time doing computation. The operating system uses SJF and FCFS scheduling algorithms to schedule the processes by considering only CPU burst time of each process. Calculate average turnaround time and average waiting time for both the algorithms.	10
5.	Assume the following workload in a system: **Process / Arrival Time (ms) / Burst Time (ms) / Priority** P1 / 5 / 5 / 0 P2 / 4 / 2 / 7 P3 / 3 / 7 / 5 P4 / 0 / 4 / 10 P5 / 3 / 5 / 5 Draw the Gantt chart illustrating the execution of these processes using Round robin scheduling algorithm (Time Quantum= 3 ms) and priority scheduling algorithm, also Calculate the average waiting time and average turnaround time.	10