

**VIT**Vellore Institute of Technology
(Deemed to be University under section 3 of U.C.A. Act, 1956)**Slot: G1+TG1****School of Computer Science Engineering and Information Systems****Fall Semester 2024-2025****Continuous Assessment Test – I****Programme Name & Branch M.Tech Integrated****Course Name & code: Operating Systems & ISWE204L****Class Number (s): VL2024250102887, VL2024250102926, VL2024250102906, VL2024250103719, VL2024250102900****Faculty Name (s): Dr.K.Arivuselvan, Dr.N.Krishnamoorthy, Dr.M.Praveen Kumar Reddy, Dr. Harshita Patel, Dr.R.Sivashankari****Exam Duration: 90 Min.****Maximum Marks: 50****General instruction(s): Answer All the Questions**

Q. No	Question	Max Marks
1.	a) Demonstrate how transition from user mode to kernel mode occurs with the bit values for protecting the operating system from errant users -and errant users from one another.	4
	b) Indicate the various services provided by the operating system that are helpful to the user and also for the efficient operation of the system?	6
2.	a) <pre>int main() { int i; for (i = 0; i < 4; i++) { fork(); printf("OS"); } return 0; }</pre> For the above code try to find the no of child process created. (15)	2
	b) Indicate the three different ways of passing parameters to the operating system by the system call and try to list the various system calls with respect to process management. Illustrate the working principle of fork(); system call elaborately.	8
3.	a) <pre>#include<stdio.h> #include<stdlib.h> int x; int y=15; int main(int argc, char *argv[]) { int *values; int i; values= (int *) malloc((sizeof(int)*5); for(i=0;i<5;i++) { values[i]=i; } return 0;</pre>	6

	} Point out the different sections of process for the above C program when it is loaded into main memory. b) What do you meant by PCB? Whether all the process in the memory has the same PCB or a different one. Justify it by mentioning the various information's present in the PCB?	4																		
4.	a) Explore the different states of a process with a neat sketch. b) Compare and contrast thread with process and List the different multithreading models with a neat diagram.	4 6																		
5.	Consider the following set of processes, with the length of the CPU burst given in milliseconds <table border="1"> <thead> <tr> <th>Process</th><th>Burst Time (milliseconds)</th><th>Arrival Time (milliseconds)</th></tr> </thead> <tbody> <tr> <td>P1</td><td>11</td><td>0</td></tr> <tr> <td>P2</td><td>3</td><td>0</td></tr> <tr> <td>P3</td><td>9</td><td>5</td></tr> <tr> <td>P4</td><td>4</td><td>2</td></tr> <tr> <td>P5</td><td>9</td><td>1</td></tr> </tbody> </table> The processes are assumed to have arrived in the order P1, P2, P5, P4 and P3. i. Draw Gantt charts that illustrate the execution of the process using the following scheduling algorithms FCFS and SRTF. ii. Calculate the turnaround time and waiting time of each process for the above algorithms. iii. Calculate the Average turnaround time and Average waiting time for the above algorithms. <i>20.6ms, 13.4ms - 15.8ms, 8.6ms.</i> iv. Which scheduling algorithm results in minimal average waiting time?	Process	Burst Time (milliseconds)	Arrival Time (milliseconds)	P1	11	0	P2	3	0	P3	9	5	P4	4	2	P5	9	1	10
Process	Burst Time (milliseconds)	Arrival Time (milliseconds)																		
P1	11	0																		
P2	3	0																		
P3	9	5																		
P4	4	2																		
P5	9	1																		