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| **Internal Assessment-1** | | | | | | | | | | | | | | | | |
| Course Title: Operating System principles and Programming | |  | |  |  |  |  |  | |  |  | |  |  |  |  |
| USN | | | | | | | | | | | | | | |
| Course Code:22ECSC202 | | Semester: 4 | | | | | | | | | | | | | | |
| Date of Exam: /05/2023 | | Duration: 75 mins | | | | | | | | | | | | | | |
| Max. Marks : 40 | |  | | | | | | | | | | | | | | |
| Note: Answer any two full questions | | | | | | | | | | | | | | | | |
| Q.No | Questions | | Mark s | | | CO | | | BL | | | PO | | | PI  Code | |
| 1a | Draw the layered architecture of UNIX in detail.  What is the main advantage of layered approach to operating system design and what are the disadvantage of the layered approach  Ch1 | |  | | |  | | |  | | |  | | |  | |
| 1b | Write the syntax for different exec() system calls.   * Write code snippet to demonstrate any exec(). * Differentiate between fork() and exec() system calls. | |  | | |  | | |  | | |  | | |  | |
| 1c | Consider two concurrently running processes X and Y as given below. State the order in which these instructions are executed. Shared data semaphore S1=0, S2=0.  Process X Process Y  do do  { {  Instruction A; Wait(S1);  Signal(S1); Instruction C;  Wait(S2); Signal(S2);  Instruction F; Wait(S1);  Signal(S1); Instruction G;  } }  While(true); While(true); | |  | | |  | | |  | | |  | | |  | |

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| Process | Arrival Time | Burst Time | Priority |
| P1 | 0 | 9 | 3 |
| P2 | 2 | 7 | 1 |
| P3 | 3 | 15 | 0 (High) |
| P4 | 6 | 3 | 2 |

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| 2a | How each process is identified? Where the information of each process will be stored. List important and default processes used in OS. |  |  |  |  |  |
| 2b | Write a C program where parent creates 3 children and termination sequence is as follows:  Third child terminated first Second child terminates next First child terminates thirdly Parent terminates in the end |  |  |  |  |  |
| 2c | What are necessary conditions for critical section problem solution.  Explain the hardware solution. What is advantage and disadvantage of the same. |  |  |  |  |  |
| 3a | Consider the following processes with their arrival time and burst time as given below:  Draw Gantt chart and compute the average waiting time and turnaround time using following algorithms.   1. Pre-emptive priority 2. SJF Non pre-emptive Which algorithm yields:    * Lowest average waiting time?    * Lowest average turnaround time? |  |  |  |  |  |
| 3b | Differentiate between PIPE and FIFO  Write a C/C++ program to send variable x from parent to child over a PIPE. Child computes an equation y=3x+4. |  |  |  |  |  |