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| **Name. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Student Admn. No.: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | | | **Printed Pages:02** | | | | |
| **School of Computing Science and Engineering**  **Summer Term Examination – July - August 2024**  **[Programme: B.TECH ] [Semester: IV ) [Batch: ]** | | | | | | | | |
| **Course Title: Operating System**  **Course Code: E2UC401B/BTCS2400/R1UC403B** | | | | **Max Marks: 100**  **Time:3 Hrs.** | | | | |
| ***Instructions:*** | | *1. All questions are compulsory.*   1. *Assume missing data suitably, if any.* | | | | | | |
|  | | | K Level | | COs | | | Marks |
| **SECTION-A (15 Marks) 5 Marks each** | | | | | | | | |
| **1.** | Explain the concept of process states and their transitions. | | K1 | | | CO2 | 5 | |
| **2.** | Describe the structure of a layered operating system | | K2 | | | CO1 | 5 | |
| **3.** | Define Deadlock and its necessary conditions for deadlock. | | K2 | | | CO3 | 5 | |
| **SECTION-B (40 Marks) 10 Marks each** | | | | | | | | |
| **4.** | Explain about Producer – Consumer Problem in Process Synchronization | | K3 | | | CO3 | 10 | |
| **5.** | Given memory partitions of 500 KB, 100 KB, 300 KB, 200 KB and 600 KB in order, how would each of the first-fit, best-fit, and worst-fit algorithms place processes of size 418 KB, 202 KB, 506 KB,11 2 KB, and 95 KB (in order)? Which the algorithms make the most efficient use of memory? | | K3 | | | CO3 | 10 | |
| **6.** | Elaborate the use of message passing & semaphore for inter process communication. | | K4 | | | CO3 | 10 | |
| **7.** | Differentiate between paging and segmentation? | | K4 | | | CO2 | 10 | |
| **SECTION-C (45 Marks) 15 Marks each** | | | | | | | | |
| **8.** | Consider the following processes which are submitted to an operating system with priority and burst times. Assume a time quantum of 2, where applicable. A lower number indicates a greater priority.   |  |  |  |  | | --- | --- | --- | --- | | Process id | Arrival Time | Burst Time | Priority | | 0 | 0 | 3 | 5 | | 1 | 2 | 2 | 4 | | 2 | 4 | 3 | 6 | | 3 | 6 | 1 | 3 |   Draw the Gantt chart for the following scheduling algorithms and compute the turnaround time and waiting time for the given Scheduling algorithms a) FCFS b) SJF c) SRTF d) Priority (Non-pre-emptive) e) Round Robin. | | K6 | | | CO2 | 15 | |
| **9.** | Consider the following page reference string. 1,2,3,4,5,3,4,1,6,7,8,7,8,9,7,8,9,5,4,5,4,2 How many page faults would occur for the following replacement algorithm, assuming four and six frames respectively? (1) LRU (2)FIFO page replacement. | | K5 | | | CO4 | 15 | |
| **10** | Explain about the RAID structure in disk management with various RAID levels of organization in detail. | | K5 | | | CO3 | 15 | |