Pokhara University

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| Level: Bachelor | Semester: Fall | Year : 2015 |
| Programme: BE | | Full Marks: 100 |
| Course: Applied Operating System | | Pass Marks: 45 |
| Time : 3hrs. |

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| *Candidates are required to give their answers in their own words as far as practicable.* |
| *The figures in the margin indicate full marks.* |
| Attempt all the questions. |

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|  | 1. Define System call. Define the properties of following operating sytem.   a. Real time  b. Time sharing  c. Parallel system.   1. Why inter process communication is required? Explain. Differentiate between user and kernel thread. Draw figures to illustrate. | 8  7 |
|  | 1. Define race conditions. What are the techniques for avoiding race condition? Why disabling interrupt method is unattractive to achieve race condition? Explain. 2. From the following set of information, Determine the average waiting time and average turnaround time using FCFS, RR (Quantum = 5) and HRRN.  |  |  |  | | --- | --- | --- | | Process | Arrival Time | Service Time (Burst Time) | | A | 0 | 3 | | B | 2 | 6 | | C | 4 | 4 | | D | 6 | 5 | | E | 8 | 2 | | 7  8 |
|  | 1. What is dispatcher and dispatch latency? Differentiate short-term scheduler, medium term scheduler and long-term scheduler. 2. Consider the following Snapshot of a system:   Allocation Max Available  Processes ABCD ABCD ABCD  P0 0012 0012 1520  P1 1000 1750  P2 1354 2356  P3 0632 0652  P4 0014 0656  Answer the following questions using the Banker's algorithm:   1. What is the content of the matrix need? 2. Is the system in a safe state? Also find the safe sequence. 3. If the request from process P1 arrives for (0, 4, 2, 0), can the request be granted immediately? | 7  8 |
|  | 1. Define segmentation. Given memory partitions of 10k, 4k, 15k, 17k and 15k in order. How would each of first- fit, best fit and worst-fit algorithms place processed of 12k, 13k and 5k, in order? Which algorithm makes the best use of memory? 2. What is page fault? Consider the following page reference strings: 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0,1. How many page faults would occur for each of the following page replacement algorithms assuming 3 and 4 pages a frame? In each case which algorithm perform better? 3. LRU page replacement 4. FIFO page replacement 5. Optimal page replacement | 7  8 |
|  | 1. Disk requests come in to the disk driver for cylinders 10, 22, 44, 20, 2, 40, 6, and 38, in that order. A seek takes 2.1 msec per cylinder moved. How much seek time is needed for 2. FCFS 3. SSTF 4. SCAN 5. CSCAN   In all cases, the arm is initially at cylinder 20.   1. Describe different memory allocation techniques in memory management. Explain Paging and TLB. | 8  7 |
|  | 1. Describe about stable storage implementation and tertiary storage structure. 2. Differentiate sequential file access method and random file access method. Explain different file allocation strategies. | 7  8 |
|  | Write short notes on: (**Any two**)   1. Producer Consumer Problem 2. Access Control List 3. RAID | 2×5 |