Pokhara University

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| Level: Bachelor | Semester: Spring | Year : 2014 |
| 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 time sharing, parallel and real-time operating systems? How they are different from one another? Explain. 2. What is a Process and a Process State? Do you think a process can exist without any state? Justify your view with the help of process state transition diagram and PCB. | 8  7 |
|  | 1. Do you feel deadlock is great enemy of computer system? If yes, why? Also write protection mechanism for deadlock. 2. When multiple processes need to cooperate, there is a choice between shared memory and inter-process communication (IPC). Compare and contrast these two techniques. What is the role of the operating system in each? | 8  7 |
|  | 1. Explain how the producer-consumer problem is relevant to an operating system. Describe briefly the semaphore based solution to this problem. 2. Consider following set of processes along with their burst time, arrival time and priorities. Calculate average waiting time and average turnaround time using following scheduling algorithms. 3. FCFS 4. SJF 5. Priority (Preemptive) 6. HRRN  |  |  |  |  | | --- | --- | --- | --- | | Process | Arrival Time | Burst Time | Priority | | A | 0 | 3 | 5 | | B | 2 | 6 | 4 | | C | 4 | 4 | 1 | | D | 6 | 5 | 3 | | E | 8 | 2 | 2 | | F | 3 | 4 | 1 | | 7  8 |
|  | 1. How many page faults occur for following reference strings for three page frames?   5,0,1,2,2, 0,3,0,4,2,3,0,3,2,1,2,1,2,0,3  Using LRU, FIFO and Optimal page replacement algorithm.   1. Differentiate virtual page and a page frame. What is the difference between LRU and NRU page replacement algorithms? Explain. | 8  7 |
|  | 1. Disk request come to the disk driver for cylinder 16, 18, 12, 6, 25, 38, 7 and 36 in that order. A seek take 2 micro sec per cylinder move. How much seek time is needed for 2. FCFS 3. Closest Cylinder Next 4. C-Scan (Initially moving upward) 5. Scan (Initially moving downward)   In all cases, the arm initially at cylinder 18. Also describe which one is best algorithm and why?   1. Give a scenario where choosing a large file-system block size might be a benefit. Give an example where it might be a hindrance. | 8  7 |
|  | 1. How does OS handle the bad sectors in the disk? Explain. 2. Compare and contrast between paging and segmentation. 3. Describe how Free Disk block are managed in Disk | 5  5  5 |
|  | Write short notes on: **(Any two)**   1. Peterson’s Algorithm 2. File access methods 3. File protection methods | 2×5 |