**Kathmandu BernHardt College**

**Bafal, Kathmandu**

**Pre-Board Examination -2069**

**Subject: Operating System (203) Set-‘A’ FM: 60**

**Level: BSC CSIT 3rd Sem. Time: 3hrs PM: 24**

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

**Section ‘A’**

**Attempt any two questions: (2x10=20)**

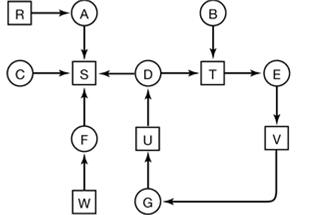
1. How thread based execution minimizes the context switching problem of process based execution? Explain the different multithreading model.
2. What is page fault? Consider the following page reference string; 3, 3, 5, 4, 7, 1, 5, 5, 1, 4, 3, 7 6, 3, 4, 1. How many page faults would occur for each of the following page replacement algorithms assuming 3, 4 frames?
   * 1. LRU page replacement ii. FIFO page replacement iii. Optimal page replacement
3. Suppose the head of a moving- head disk with 200 tracks, numbered 0 to 199 is currently serving request at tracks 143 and has finished a request at track 125. The queue it requests is kept in the FIFO order 86, 147, 91, 177, 94, 150, 102, 175, 130. What is the total head movement needed to satisfy these request for the following disk- scheduling algorithms?

i) FCFS ii) SSTF iii) SCAN iv) LOOK

**Section ‘B’**

**Attempt any eight questions: (8x5=40)**

1. List the different file attributes. Briefly explain the different types of file operations
2. How does DMA increase system concurrency? How does it complicate hardware design?
3. What is segmentation? Explain the mapping of virtual address to real address under segmentation in MULTIC architecture.
4. Explain the resource allocation graph shown below is in deadlock state or not with necessary algorithm.



1. What is PCB? How it is different from TCP? Explain briefly
2. Differentiate between Real Time and Time sharing operating system.
3. What is Fragmentation? Differentiate between internal and external fragmentation.
4. Write short notes on
5. Memory-mapped I/O ii. Goals of I/O Software
6. What is multilevel feedback Queues scheduling?How does it solve the problem of starvation?
7. What is interleaving? How interleaving improve the disk performance.

**GOOD LUCK**

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**Section ‘A’**

**Attempt any two questions: (2x10=20)**

1. What is file? Explain the difference between master and transaction file. Explain various file allocation methods with their merits and demerits.
2. What is swapping? Why is it done? Given memory partitions of 10 k, 4 k, 20 k, 18 k, 7 k, 9 k, 12 k and 15 k (in order). How would each of first-fit, best fit and worst fit algorithms place processes of 12 k, 10 k, and 9 k (in order)? Which algorithms make the best use of memory
3. How does semaphore do the process synchronization? Do you think semaphore is the best solution for solving critical section problem? Explain Producer-consumer problem.

**Section ‘B’**

**Attempt any eight questions: (8x5=40)**

1. What is thrashing? Explain the cause and solution for thrashing.
2. Discuss in detail the use of translation look aside buffer (TLB) in the process of paging. Support your answer with illustration.
3. What is memory-mapped I/O? Explain with merits and demerits
4. Consider the following data and answer the questions using Banker’s algorithm.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Allocation | Max | Available |
|  | A B C D | A B C D | A B C D |
| P0 | 0 0 1 2 | 0 0 1 2 | 1 5 2 0 |
| P1 | 1 3 5 4 | 1 3 5 0 |  |
| P2 | 1 0 0 0 | 1 7 5 0 |  |
| P3 | 0 6 3 2 | 0 6 5 2 |  |
| P4 | 0 0 1 4 | 0 6 5 6 |  |

What is the content of matrix need? If a request from process P1 arrives for (0, 4, 0, 0) can be granted immediately?

1. Write short notes on
2. Stable storage ii. Virtual Machines
3. What do you mean by interrupt? Explain the working mechanism of interrupt controller.
4. Draw and describe the 3-state process model
5. List the essential properties for the Batch-Oriented and Interactive operating system.
6. What is disk scheduling? Explain SCAN scheduling with example.
7. What are the scheduling criteria? How does preemptive priority scheduling introduce starvation.

**GOOD LUCK**