



'समानो मन्त्रः समितिः समानी'

**UNIVERSITY OF NORTH BENGAL**

B.Sc. Honours 3rd Semester Examination, 2022

**CC6-COMPUTER SCIENCE (32)**

**OPERATING SYSTEMS**

Time Allotted: 2 Hours

Full Marks: 40

**GROUP-A**

**Answer any five questions from the following**

1×5 = 5

1. What do you mean by Time-Sharing Operating Systems?
2. What is a safe state and an unsafe state?
3. Differentiate between process and thread.
4. What do you mean by system calls?
5. Differentiate between Trap and Interrupt.
6. What is the main function of the memory-management unit?
7. What is file system mounting?
8. What is dispatcher?

**GROUP-B**

**Answer any three questions from the following**

5×3 = 15

9. Define process. Explain the process states with a suitable diagram.
10. What is PCB? How the operating system maintain the state of a process using PCB?
11. Can a system detect that some of its processes are starving? If yes, explain how it can. If no, explain how the system can deal with the starvation problem.

12. Explain the following:  
(a) Paging and segmentation  
(b) Swapping.
13. What is critical-section problem? How to solve critical-section problem?

**GROUP-C**

**Answer any *two* questions from the following**

10×2 = 20

14. Explain FCFS, RR and SJF scheduling algorithm with illustrations.
15. Write short notes on:  
(a) File Systems  
(b) Inter-process Communication (IPC).
- 16.(a) A computer system has a 36-bit virtual address space with a page size of 8K, and 4 bytes per page table entry.  
How many pages are in the virtual address space?  
What is the maximum size of addressable physical memory in this system?
- (b) Discuss DMA transfer and DMA controller.
17. Write short notes on:  
(a) Deadlock prevention  
(b) Semaphores and monitors.

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