

Sri Lanka Institute of Information Technology

Operating System and System Administration IT2060



Assignment 02

Due Date: 03rd of May before 11.30 a.m.

Marks: 20

Question 01 (8 marks)

Servers can be designed to limit the number of open connections. For example, a server may wish to have only n socket connections at any point in time. As soon as n connections are made, the server will not accept another incoming connection until an existing connection is released. The connection acceptance is done by a function called as *accept()*. Explain a solution with the semaphores to solve the access problem in the server to limit the number of concurrent connections. Clearly indicate the initial value of the semaphore.

Question 02 (2 marks)

Explain why implementing synchronization primitives by disabling interrupts is not appropriate in a single-processor system if the synchronization primitives are to be used in user-level programs.

Question 03 (4 marks)

Consider the following snapshot of a system:

Process	Allocation	Maximum Needs	Available
A	4	6	1
B	2	5	
C	2	3	
D	1	5	

Answer the following questions using the banker's algorithm

- i. Is the system in a safe state? If so what is the safe sequence.
- ii. If a request from process D arrives for 1 resource, can the request be granted immediately?

Question 04 (6 marks)

Assume a system which uses 16-bit address space (0 to 65535) and a user program is allowed to access only addresses from 0 to 20000. Given a page size of 1KB, answer the following questions.

- i) How many pages are there in the system?
- ii) How many entries of the page table (for that program) will be set as valid pages by the operating system?
- iii) Is there any internal fragmentation? Explain your answer. If so, compute the size of the fragmentation.

Instruction for submission

- 1. Students have to submit their solutions to the assignment on or before its due date. **LATE SUBMISSION WILL NOT BE ACCEPTED.**
- 2. Answers must be uploaded with given **Link with the Google form.**
- 3. Enter your SLIIT email address. **You allowed to submit only once but the submit answer can be modified later.**
- 4. Do not include any SCREEN SHOTS of answers or IMAGES.
- 5. **Write short answers.**
- 6. Plagiarism, cheating, coping the answer will be given **ZERO** marks.