2021

The Open University of Sri Lanka
BSc Degree Programme – 2024/2025
Department of Computer Science
CSU4300/CSU5315– Operating Systems
No Book Test 2 (NBT-2)
Duration: One hour only (1 hour)

Date: 11.10.2024 Time: 4.00 p.m. – 5.00 p.m.

ANSWER ALL QUESTIONS

QUESTION 1

1.1) List two (2) types of memory partitioning schemes in an operating system.

1.2) Compare external fragmentation and internal fragmentation.

1.3) Suppose OS on your computer uses buddy system memory allocator with 4-megabyte block of memory. Show result of each request / release of memory in the following sequence via successive figures.

A: Request 400K
B: Request 210K
C: Request 100K
Release A
D: Request 30K
Release B
Release C
Release D

How much internal fragmentation exists after the D's Request?

1.4) Suppose a file Janaka.txt has a permission number 643. What are the owner, group and world permissions available for the Janaka.txt?

QUESTION 2

2.1) Describe *Indexed allocation* scheme in file using suitable example.

2.1)1. Suppose the free memory manager of an operating system has the following unallocated blocks of memory namely A to E with below mentioned sizes. Three incoming processes P, Q and R request for 9KB, 6KB and 7KB of memory from the memory manager respectively.

Free Block Name	Block Size
A	8 KB
B	12 KB
C	5 KB
D	15 KB
E	3 KB

State the name of the free block that is allocated to each of incoming processes, P, Q, R based on the following algorithms. State all the assumptions you make

i. Best Fit
ii. Worst Fit
iii. First Fit
iv. Next Fit

2.2) Suppose a disk drive has 500 cylinders which are numbered from 0 to 499. The drive currently services a request at cylinder 250 and the previous request was cylinder 200. The queue of pending requests in order are as follows;

100, 140, 220, 350, 210, 170, 300, 400, 50

Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk scheduling algorithms?

(i) SCAN

(ii) SSTF

(iii) C-LOOK

(No diagram drawing is necessary. Show the appropriate steps in your calculations and state your assumptions)