The Open University of Sri Lanka
Department of Computer Science
B.Sc. Degree Programme: Level 04/05
No Book Test (NBT) 2 - 2017/2018
CPU4300 / 5315 – Operating Systems
Duration: One Hour

·061

Date: 22/07/2018   Time: 4.00pm – 05.00pm

Answer All Questions.

QUESTION 1

1.1)   List the key features of *static* and *dynamic* memory allocation in an operating system.

1.2)   Compare *buddy system* and *lazy buddy system* memory allocators. Assume an operating system in a computer uses the buddy system memory allocator with 2-megabyte block of memory. Show result of each request / release of memory in the following sequence via successive figures.

A: Request 80K
B: Request 180K
C: Request 120K
Release B
D: Request 30K
Release A
Release C
Release D

How much Internal fragmentation exists after the C's Request?

1.3)   Suppose the free memory manager of an operating system has the following un-allocated blocks of memory, namely A to F with below mentioned sizes. Three incoming processes P, Q and R request for 13KB, 10KB and 7KB of memory from the memory manager respectively.

Free Block Name	Block Size
A	11KB
B	16KB
C	30KB
D	14KB
E	9KB
F	15KB

State the <u>name of the free block</u> that is allocated to each of the incoming processes P, Q and R based on the following algorithms. State all the assumptions you make.
    i. Best Fit
    ii. Worst Fit
    iii. First Fit
    iv. Next Fit

1.4)   Indicating all your steps, calculate the internal fragmentation of Best Fit and Worst Fit memory allocation schemes of your answer to the question 1.3.

QUESTION 2

2.1)   Draw a diagram to show the address translation mechanism of a system having a multilevel page table.

2.2)   List the advantages of *indexed allocation* over *linked allocation* in the context of file allocation methods.

2.3)   List the permissions given to a file having permission number 573.
(Hint : Draw a table or a tree of permissions)

2.4)   Suppose a disk drive has 400 cylinders numbered from 0 to 399. The drive currently services a request at cylinder 210 and the previous request was cylinder 140. The queue of pending requests in order is as follows; 100, 130, 200, 350, 220, 150, 310, 370, 70.

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? (Show the appropriate steps in your calculations and state your assumptions)

(i) SSTF
(ii) C-LOOK

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