The Open University of Sri Lanka
Department of Mathematics and Computer Science
B.Sc. Degree Programme: Level 05
No Book Test (NBT) 2 - 2012/2013
CPU3242 – Operating Systems
Duration: One and Half Hours

Date: 20/03/2013 **Time: 4.00pm – 5.30pm**

Answer All Questions

QUESTION 1

1.1) List 3 drawbacks of coalescing holes in the computer memory.

1.2) What is a page fault in the context of memory management? Write the tasks that the operating system performs after a page fault occur.

1.3) Suppose the free memory manager of an operating system has the following unallocated blocks of memory namely A to E with below mentioned sizes. Two incoming processes P and Q request for a 15KB of memory and 5KB of memory from the memory manager respectively. The process P comes first to the queue of the memory manager.

Free Block Name	Block Size
A	6KB
B	13KB
C	19KB
D	10KB
E	15KB

State the name of the free block that is allocated to each of the incoming processes P and Q 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) Suppose the Operating system in your computer uses buddy system for memory management. Initially the system has 1 Megabyte (1024k) block of memory which begins at address 0, Show the results of each request/release via successive figures.

A: Request 70K
B: Request 35K
C: Request 80K
Release A
D: Request 60K
Release B
Release D
Release C

How much internal fragmentation exists after the Request C.

QUESTION 2

2.1) Compare LFU and LRU page replacement algorithms.

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

2.3) Give the difference between *Raid 5* and *Raid 6* disk management schemes.

QUESTION 3

3.1) Describe the terms piggybacking and masquerading in the context of physical access control.

3.2) Explain permissions of a file in a Unix system by giving an example.

3.3) Suppose a disk drive has 3000 cylinders which are numbered from 0 to 2999. The drive currently services a request at cylinder 100 and the previous request was cylinder 150. The queue of pending requests in order are as follows; 200, 2500, 800, 1400, 600, 1900, 1000, 1450, 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? (show the appropriate steps in your calculations)

(i) FCFS
(ii) SSTF
(iii) C-SCAN
(iv) LOOK