The Open University of Sri Lanka
Department of Mathematics and Computer Science
B.Sc. Degree Programme: Level 05
No Book Test (NBT) 2 - 2016/2017
CPU3242 – Operating Systems
Duration: One and Half Hours

Date: 30/05/2017 **Time: 4.00pm – 05.30pm**

Answer All Questions

QUESTION 1

1.1) Briefly explain the term *coleasing* in the context of memory management

1.2) Draw a diagram to describe the logical address translation mechanism with the combination of segmentation and paging.

1.3) Suppose the free memory manager of an operating system has the following unallocated blocks of memory, namely A to F with below mentioned sizes. Three incoming processes P, Q and R request for 15KB, 11KB and 8KB of memory from the memory manager respectively.

Free Block Name	Block Size
A	18KB
B	9KB
C	27KB
D	7KB
E	12KB
F	15KB

State the name of the free block that is allocated to each of the 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

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

QUESTION 2

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

2.2) The permissions of a saman.txt file in Unix is given as **r - x rw- - - x** in the standard notation. Explain the user rights of saman.txt.

2.3) What is the capacity of a hard disk (in Terabytes) with 128 bytes per sector, 1024 sectors per track, 2048 cylinders and 5 double sided platters?

QUESTION 3

3.1) Briefly explain the *Raid 1* disk management scheme.

3.2) Suppose a disk drive has 400 cylinders which are numbered from 0 to 399. The drive currently services a request at cylinder 200 and the previous request was cylinder 150. The queue of pending requests in order are as follows; 120, 30, 270, 300, 220, 160, 340, 370, 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 and state your assumptions)

(i) SSTF
(ii) C-LOOK