

Department of Higher Education
University of Computer Studies, Yangon
Fourth Year (B.C.Sc.)
Operating Systems(CS-403)
Final Examination
September, 2018

Answer ALL questions.

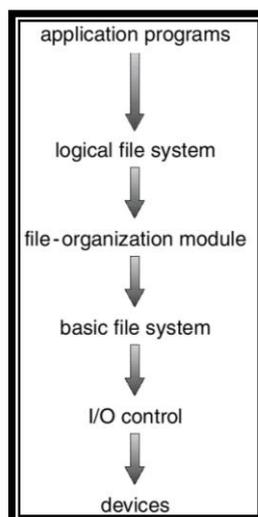
Time allowed: 3 Hours.

1. Define any **FOUR** of the followings. **(8 marks)**
 - (a) Binary Semaphore
 - (b) Mutual Exclusion
 - (c) Compile time
 - (d) Busy Waiting
 - (e) First fit

2. Write any **THREE** of the followings comparison and difference. **(12 marks)**
 - (a) Linked allocation Vs. Indexed allocation in Disk System
 - (b) Deadlocks and Starvation
 - (c) Global Vs. Local allocation
 - (d) Safe state Vs. Unsafe state

3. Write short note on the followings. **(16 marks)**
 - (a) How to make process termination for recovery from deadlock?
 - (b) How overlays solve the not enough memory allocation?
 - (c) How made the swapping two process from backing store to memory vice versa?
 - (d) Discuss the cause of Thrashing.

4. Describe or briefly explain any **THREE** of the followings. **(24 marks)**
 - (a) Different between paging and segmentation.
 - (b) Briefly describe directory structure: Two-level, Tree Structure and Acyclic Graph Tree.
 - (c) Discuss the deadlock detection.
 - (d) Describe the structure of layered file system and explain the function of each layer.



5. (a) Given memory partitions of 100K, 500K, 200K, 300K, and 600K (in order), how would each of the First-fit, Best-fit, and Worst-fit algorithms place processes of 214K, 415K, 110K, and 425K (in order)? Which algorithm makes the most efficient use of memory? **(6 marks)**

(b) Consider a paging system with the page table stored in memory **(4 marks)**

- (i) If a memory reference takes 200 nanoseconds, how long does a paged memory reference take?
- (ii) If we add associative registers (TLB), and 75 percent of all page-table references are found in the TLB, what is the effective memory reference time? (Assume that finding a page-table entry in the TLB takes zero time, if the entry is there.)

(c) Consider the following snapshot of a system: **(10 marks)**

Process	Allocation				Maximum				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	2	5	5	3
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

Answer the following questions using Banker's algorithm:

- (i) What is the content of the matrix need?
- (ii) Is the system is a safe state? (Need to specify step by step)
- (iii) If a request from process P1 arrives for (0, 4, 3, 0) can the request be granted immediately?

(d) Consider the following page reference string: **(10 marks)**

2, 3, 4, 5, 3, 2, 6, 7, 3, 2, 3, 4, 8, 7, 4, 3, 2, 3, 4, 7.

How many page faults would occur for the following replacement algorithms, assuming three frames? Remember all frames are initially empty, so your first unique pages will all cost one fault each.

- LRU replacement
- FIFO replacement
- Optimal replacement

(e) (i) List three examples of deadlocks that are not related to a computer-system environment. **(4 marks)**

(ii) Give a labeled diagram of two files allocated using the FAT method. The first file comprises block 300, 60, 250 and 700 (in that order - block 300 is first). The second file comprises block 100, 150, 10, 320 (in that order- block 100 is first). You should give diagram showing the relevant detail of the block of the FAT. You should also give directory structure for these two files. **(6 marks)**
