Department of Higher Education
University of Computer Studies, Yangon
Third Year (B.C.Sc./B.C.Tech.)
Final Examination
Operating Systems (CST-301)
September, 2018

Answer ALL questions **Time allowed: 3 hours.**

1. Choose the correct answer of the followings: (10 Marks)

(1) A _____ architecture assigns only a few essential functions to the kernel including address space, IPC and basic scheduling.
A. monolithic kernel B. layered C. microkernel D. SMP

(2) In five state process model _____ state is a process than that cannot execute until some event occurs, such as the completion of an I/O operation.
A. Ready B. Paused C. Queued D. Blocked

(3) _____ are used by the operating system to manage the I/O devices and channels of the computer system.
A. Memory tables B. I/O tables C. File tables D. Process tables

(4) The _____ is the interface that is the boundary between hardware and software.
A. ABI B. ISA C. IAS D. API

(5) The operating system's _____ refers to its inherent flexibility in permitting functional modifications to the system without interfering with service.
A. efficiency B. ability to evolve C. controlled access D. convenience

(6) The technique where a system clock generates interrupts, and at each clock interrupt the OS regains control and assigns the processor to another user, is _____ .
A. time slicing B. multithreading C. round robin D. clock cycle

(7) _____ relates to an error or exception condition generated within the currently running process, such as illegal file access attempt.
A. Trap B. Interrupt C. Supervisor call D. Fault

(8) A _____is collection of related fields that can be treated as a unit by some application program.
A. field B. file C. record D. database

(9) The _____ maintains the key characteristic of the sequential file: Records are organized in sequence based on a key field.
A. pile B. sequential file C. indexed sequential file D. indexed file

(10) The user can add data to the file, often only at the end, but cannot modify or delete any of the file's contents.
A. Appending B. Updating C. execution D. Reading

2. Write short notes **Any FOUR** of the followings. (16 Marks)

(i) Four basic thread operations.
(ii) What are the distinctions among logical, physical and relative address?
(iii) Difference between turnaround time and respond time
(iv) What is the different between block-oriented devices and stream-oriented devices?
(v) List and briefly define three file allocation methods.

3. Describe **Any THREE** of the followings. (24 Marks)

(a) Briefly describe the three types of processor scheduling.
(b) Explain any two memory management techniques and discuss their strengths and weaknesses of these techniques.
(c) Compare the seven RAID levels for multiple-disk database design.
(d) Briefly describe the architecture of file system.

4. (a) Consider the following set of process. (15 Marks)

Process	Arrival Time	Service Time
A	0	3
B	1	4
C	3	3
D	8	5
E	9	2

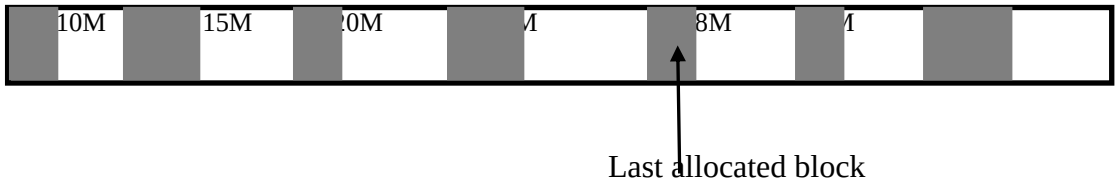
Schedule these processes using the following policies and also compare their performance.

(i) Shortest process Next
(ii) Round-Robin (q=3)
(iii) Feedback ($q=2^i$)

4. (b) Consider the disk scheduling problem: we assume that a disk with 200 tracks and that the disk request there has random request in it. The requested tracks, in the order received by the disk scheduler are 55, 58, 39, 18, 90, 160, 150, 38, 110, and 184. Assume that starting track is 120. Calculate the average seek length for FIFO, SSTF, SCAN (in the direction of **increasing** track number) and C-SCAN (in the direction of **decreasing** track number) scheduling algorithms. (15 Marks)

5. (a) Answer **all questions** on the followings: (15 Marks)

(i) A new 12-Mbytes allocation request is made in the following figure. Indicate the intervals of memory where a partition will be created for the new process under four placement algorithms: best fit, first-fit, next-fit and worst fit. For each algorithm, draw the horizontal segment under memory strip and label it clearly.



(ii) Consider a simple segmentation system that has the following segment table:

Starting Address	Length(Bytes)
256	400
178	282
2,650	198
332	604
431	152

For each of the following logical address, determine the physical address or indicate if a segment fault occurs:

(a) 1,200
(b) 2,362
(c) 2,099
(d) 3,444
(e) 1,222

5. (b) In some application, such as airline reservation system and inventory control system, where timeliness of information is critical and where data are rarely processed exhaustively which type of file organization are used mostly? Give suitable reasons for your answers.

(5 Marks)

****