

ALCCS – OLD SCHEME

Time: 3 Hours

AUGUST 2013

Max. Marks: 100

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE:

- Question 1 is compulsory and carries 28 marks. Answer any FOUR questions from the rest. Marks are indicated against each question.
- Parts of a question should be answered at the same place.

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- Q.1**
- a. What are the two main functions of an operating systems?
 - b. Why “disable all interrupts” is implemented only in kernel mode?
 - c. How does priority scheduling differ from round robin method?
 - d. What is device independence?
 - e. What are the different modes in which processes are executed?
 - f. Give an example of the situation describing deadlock.
 - g. What is RAM Disk? (7×4)
- Q.2**
- a. Draw process transition diagram and explain the meaning of “ready to swap in” process. (5)
 - b. Give an example of classical problem of concurrent programming and show how it leads to deadlock? (5)
 - c. Explain the concept of Least Recently Used memory page replacement method and how it is different from First In First Out (FIFO) page replacement method. (8)
- Q.3**
- a. What is the use of process table in process management? How does OS update a process table? (6)
 - b. How does memory compaction works? Write an algorithm for the memory compaction. (6)
 - c. For a given reference strings: 1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5. Using LIFO algorithm of page replacement, compute number of page faults for number of frame = 3 and number of frame = 4. (6)

Code: CS31

Subject: OPERATING SYSTEMS

- Q.4** a. Discuss the file protection mechanisms incorporated in a Unix file system. (6)
- b. Define UFD and MFD. What are the most common schemes for defining the logical structure of a directory? (6)
- c. What is Virtual File Systems? How is it implemented? (6)
- Q.5** a. Why is it difficult to protect a system in which users are allowed to do their own I/O? Explain how relocation helps for the protection of the data? (6)
- b. What are the advantages of Contiguous allocation? What are the drawbacks of contiguous allocation of disk space? (6)
- c. A hard disk has 63 sectors per tracks, 10 platters each with 2 recording surfaces and 1000 cylinders. The address of a sector is given as a triple $\langle c, h, s \rangle$ where c is the cylinder number, h is the surface number and s is the sector number. Thus 0th sector is addressed as $\langle 0, 0, 0 \rangle$, the 1st sector is addressed as $\langle 0, 0, 1 \rangle$ and so on. Calculate the sector number whose address is $\langle 400, 16, 29 \rangle$. (6)
- Q.6** a. What advantages do threads have over multiple processes? What major disadvantages do they have? (5)
- b. What is the time stamping scheme of distributed system for mutual exclusion? Explain the functioning of the scheme through a diagram. (5)
- c. Write one method suitable for inter-processor communication in hypercube multiprocessor operating system. (8)
- Q.7** Write short notes on any **THREE** of the followings:
- (i) Virtual Memory
 - (ii) Clock Synchronization
 - (iii) Interrupt Handling
 - (iv) Binary semaphore
- (6+6+6)