

ALCCS – OLD SCHEME

Time: 3 Hours

FEBRUARY 2012

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.

- Q.1**
- Write the four basic functions of an Operating system.
 - Differentiate between 'Ready to run process in Memory Management' and 'Ready to run process Swapped'.
 - What is Binary semaphore?
 - What is major and minor number?
 - What are the different modes in which processes are executed?
 - How a "multiprocessor" operating system is different from "multiprocessing" operating systems?
 - Draw the structure of I-Node in UNIX OS. (7 × 4)
- Q.2**
- What is degree of multiprogramming? Describe multiple partition memory allocation giving its advantages and disadvantages. (6)
 - When a process is said to be in Zombie state? (4)
 - Compare Best fit, First fit and Worst fit memory allocation in terms of internal fragmentation and external fragmentation. (8)
- Q.3**
- Draw diagram showing state transition of process during execution in a timesharing operating system that allows preemption. (6)
 - Read the following pseudo code to resolve critical section problem and identify the case when this code fails. (6)

```
int TURN;  
TURN = 0;  
TURN – J implies process J enters into the critical section  
Do {  
    while (TURN != J);  
    critical section;  
    TURN=I;  
    Remainder section;  
} while (1);
```

- c. What is Belady's anomaly? For a given reference strings: 1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5. Using FIFO algorithm of page replacement compute number of page faults for number of frame = 3 and number of frame = 4. (6)
- Q.4** a. Outline the operations that are carried out on a directory. Give advantages and disadvantages of single level, double level and tree structured directory. (4)
- b. How the file access is controlled in UNIX operating System. Give the meaning of 10 characters associated with file permissions in UNIX. Give syntax of chmod command. (8)
- c. Explain the Shortest Seek Time First (SSTF) algorithm and find the total head movement for seek job queue (98, 183, 27, 122, 14, 124, 65, 67) where head pointer is at 53. (6)
- Q.5** a. Describe the mechanism used for synchronization of multiple processors in parallel computing. (6)
- b. What are the security problems in an OS? What role Access Matrix plays in protecting resources in an OS. (6)
- c. Distinguish between the 'client-server' and 'peer to peer' models of distributed systems. (6)
- Q.6** a. What is the role of a process table in an OS? (5)
- b. Explain the concept of sticky bits and give the command with syntax and value used in Unix to set sticky bits of an application. (5)
- c. Describe a deadlock situation and explain the combined approach of deadlock handling. (8)
- Q.7** Write short notes on the followings:
- (i) Remote Procedure Call (6)
- (ii) 'Token passing' network Vs 'Ethernet' network (6)
- (iii) Network File System (6)