

**ALCCS – OLD SCHEME**

Code: CS31  
Time: 3 Hours

Subject: OPERATING SYSTEMS  
Max. Marks: 100

**AUGUST 2011**

**NOTE:**

- Please write your Roll No. at the space provided on each page immediately after receiving the Question Paper.
- 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**

- a. Explain the terms: Waiting time, Turnaround time, Response time and Throughput.
- b. What is time slice? What is the importance of this value in a Time Sharing Operating System?
- c. Give the schematic view of Virtual File Systems and describe the concept behind it.
- d. What is the need of Inter Process Communication and how is it achieved?
- e. Define the term thrashing and also explain how it affects the overall performance of CPU.
- f. Differentiate between Dynamic relocation and Dynamic loading.
- g. Describe role of Interrupt Handlers in device management. (7 × 4)

- Q.2**
- a. Describe the advantages of Input / Output interfaces. What all components constitutes I/O interface? (6)
  - b. Explain the inverted page table mechanism of memory management. How a logical address is translated into physical address? (8)
  - c. What is compaction? How is it used to reduce external fragmentation in memory management? (4)

- Q.3**
- a. When does a race condition arise and how it is resolved? In the following situation determine whether the system is in safe state. If so, give sequence of process. There are five process  $P_0, P_1, P_2, P_3$  and  $P_4$  and three resource types A (10 instances), B (5 instances) and C (7 instances). Snapshots a time  $T_0$  is as follow: (12)

Process	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P <sub>0</sub>	0	1	0	7	5	3	3	3	2
P <sub>1</sub>	2	0	0	3	2	2			
P <sub>2</sub>	3	0	2	9	0	2			
P <sub>3</sub>	2	1	1	2	2	2			
P <sub>4</sub>	0	0	2	4	3	3			

b. For reference strings: 1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5; determine number of page faults for number of frame = 3 using LRU algorithm. (6)

**Q.4** a. What is 'Monitor'? Briefly describe its role in Distributed Operating System. (4)

b. Give an example to clarify the concept of atomic transaction. How atomic transaction helps in achieving synchronization in distributed atomic environment? (8)

c. Explain the SCAN 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. What all information are written in super block of a FS created under UNIX OS? (6)

b. Write the mechanism adopted in Trap Handling in Window NT. (6)

c. Differentiate between stateless and stateful file services. (6)

**Q.6** a. How does a new process created in UNIX OS? Explain. (6)

b. What is thread and how is it different from a process? (4)

c. How synchronization is achieved in Distributed Operating System using Mutex? (8)

**Q.7** Write short notes on the followings:

(i) Layered Protocol (6)

(ii) Direct Memory Access (6)

(iii) Election Algorithm (6)