Total No. of Questions : 5] [Total No. of Printed Pages : 4

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CS–502(N)

B. E. (Fifth Semester) EXAMINATION, June, 2011

(Computer Science & Engg. Branch)

OPERATING SYSTEM

[CS–502(N)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt all questions. All questions carry equal marks.

Unit–I

1. (a) What is Spooling ? What are the advantages of spooling over buffering ? 8

   (b) What are real time operating systems ? How are they developed and implemented ? Illustrate some applications where they can be used. 12

Or

Define the essential properties of the following types of OS : 20

(i) Batch

(ii) Real time

(iii) Time sharing

P. T. O.

Unit – II

2. Write short notes on any *two* of the following : 10 each

   (a) File Access methods

   (b) Interrupt and service routine

   (c) I/O buffering and kernel I/O subsystems

Unit – III

3. (a) Describe the Banker's Algorithm for safe allocation. Consider a system with three processes and three resource types and at time to the following snapshot of the system has been taken : 15

Process	Allocated			Maximum			Available		
	R_1	R_2	R_3	R_1	R_2	R_3	R_1	R_2	R_3
P_1	2	2	3	3	6	8	7	7	10
P_2	2	0	3	4	3	3			
P_3	1	2	4	3	4	4			

   (i) Is the current allocation a safe state ?

   (ii) Would the following requests be granted in the current safe state ?

      (1) Process P_2 requests (1, 0).

      (2) Process P_1 requests (1, 0).

   (b) Explain critical section problem. 5

Or

Suppose that the given ahead processes arrive for execution at time indicated : 20

Process	Arrival Time	Burst Time
P_1	0·0	8
P_2	0·4	4
P_3	1·0	1

Calculate Average turn around time, Average waiting time and throughput :

(i) FCFS

(ii) SRTF

(iii) Non-Pre-emptive SJF

Unit – IV

4. Consider the following reference string : 20

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2 3, 6

How many page faults would occur for the following replacement algorithms, assuming three, five or six frames :

(i) CRU

(ii) Optimal

Or

On a system using demand paged memory it takes 200 ns to satisfy a memory request if the page is in memory. If the page is not in memory, the request takes 7 ms if a free frame is available or the page to be swapped out has not been modified. It takes 15 ms if the page to be swapped out has been modified. What is the effective access time (E.A.T.) if the page fault rate is 5% and 60% of the time the page to be replaced has been modified ? Assume the system is only running a single process and the CPU is idle during page swape. 20

June 2011 V

Unit – V

5. (a) Explain the design issue of distributed operating system. 10

(b) Explain the remote procedure call. 10

Or

(a) Explain parallel processing and concurrent processing. 10

(b) Explain the security aspect of operating system. 10