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Fourth Semester

Supplementary Examination

Roll No.

B. Tech. (CSE)

(August- 2018)

CO-204 OPERATING SYSTEMS

Time: 3hrs

Max. Marks: 40

Note: Question No. 1 is compulsory. Answer any 3 questions from the remaining. Assume suitable missing data if any.

Q1. Answer the following:

(2*5=10)

a) What is meant by symmetric and asymmetric multiprocessing?

b) What is a deadlock? What are the conditions that must hold for deadlock prevention?

c) How is interrupt different from a trap?

d) What is meant by locality of reference?

e) What is kernel mode and user mode?

Q2. a) What are the advantages of multiprogramming?

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b) Differentiate between parallel and distributed systems? What are the advantages and disadvantages of using them?

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c) Consider the following snapshot of a system:

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	Allocation	Max	Available
	ABCD	ABCD	ABCD
P0	6012	4001	3211
P1	2750	1100	
P2	2356	1254	
P3	1653	0633	
P4	1656	0212	

1211

Answer the following questions using the Banker's deadlock avoidance algorithm:

- a. What is the content of the Matrix *Need*?
- b. Is the system in a safe state?
- c. If a request from process P1 arrives for (0,4,2,0) can the request be granted immediately?

Q3. a) Five jobs are in the ready queue waiting to be processed. Their estimated CPU cycles are as follows: 8,4,5,10 and 2. Using Round Robin scheduling algorithm which has a time quantum of 4 secs, what will be average waiting time and turnaround time for each process? 5

b) Explain in detail the Readers-Writers Problem. 5

OR

Write Peterson Algorithm for 2-process synchronization to critical section problem and discuss briefly. 5

Q4. a) Describe any two methods of free space management. 4

b) Discuss various issues involved in selecting appropriate disk scheduling algorithm. Let a disk drive has 5000 cylinders from 0 to 4999. Currently drive is at 173rd cylinder, and the previous request was at cylinder 155. Queue of pending request in FIFO order 126, 1578, 1013, 562, 200, 1709, 630, 3130. What is the total distance the disk arm moves to satisfy all the pending requests for each of the following disk scheduling algorithms from current position:

i) FCFS ii) SCAN iii) LOOK.

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Q5. a) Explain page fault handling routine with diagram.

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b) Define Virtual Memory. Consider a user program of logical address of size 6 pages and page size is 4 bytes. The physical address contains 400 frames. The user program consists of 22 instructions a, b, c, . . . u, v. Each instruction takes 1 byte. Assume at that time the free frames are 17, 36, 52, 40, 55, 16, 8, 12, 70, and 100. Answer the following:

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- i) Draw the logical and physical maps and page tables?
- ii) Allocate each page in the corresponding frame?
- iii) Find the physical addresses for the instructions m, d, v, r?
- iv) Calculate the fragmentation, if it exists?

OR

Consider the following page reference string:
1,2,3,4,2,1,2,6,2,1,2,3,7,6,3,5,1,2,3,7. How many page faults would occur for the optimal page replacement algorithm, assuming four frames and all frames are initially empty.

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END