

Roll No. ....

**2218**

**B. E. 5th Sem. (IT)**

**Examination – December, 2009**

**PRINCIPLES OF OPERATING SYSTEM**

**Paper : CSE-301-E**

**Time : Three hours ]**

**[ Maximum Marks : 100**

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note :** Attempt any five questions.

1. (a) Suppose that there are 5 jobs requiring a time of 10 units, 29 units, 3 units, 7 units and 12 units. If the time slice is 5 units then calculate the turn around time and average waiting time of each job by applying the following algorithms : 10

(i) FIFO

(ii) SJF

(iii) Round Robin

- (b) What are concurrent processes?

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(c) What is critical section? What are the ways by which critical section problem can be resolved ? 6

2. (a) An OS contains 2 resource classes. The number of resource units in these classes is 4 and 5 respectively. The current resource allocation state is shown below :

Process	Allocated Resources		Maximum Required	
	R1	R2	R1	R2
P1	1	3	2	5
P2	2	1	3	2

Would the following requests be granted in the current state ? Give reason in support of your answer : 12

- (i) Process P2 requests (1,1)
- (ii) Process P1 requests (0,1)
- (iii) Process P1 requests (1,0)

(b) Describe the following: 8

- (i) Short, long and middle term scheduler
- (ii) Dispatcher

3. (a) Discuss the similarities and differences between paging and segmentation. What are advantages of combining paging with segmentations? 10

(b) Consider the following page reference string : 10

A, B, C, D, B, A, E, F, B, A, B, C, E, G, C, B, A, B

How many page faults would occur for the following replacement algorithms assuming four available frames? All frames are initially empty:

- (i) LRU
- (ii) FIFO
- (iii) Optimal

4. (a) Discuss various file allocation and access methods. Compare their advantages and disadvantages. 10

(b) What is fragmentation? What are its types? How they are minimized in different memory management schemes? 10

5. (a) Discuss the following: 10

- (i) Compaction
- (ii) I/O buffering

(b) What is a semaphore? How it is different from Monitors? Implement wait( ) and signal( ) without busy wait for binary semaphores. 10

6. (a) Differentiate between physical address and logical addresses. 6



(b) A machine has 48 bit virtual addresses and 32 bit physical addresses. Pages are of 8K. how many entries are needed for a conventional page table and for an inverted page table. 8

(c) What is thrashing? What is the cause of thrashing? How does the system cope up with thrashing. 6

7. (a) What are threads? What are the difference between user level threads and kernel level threads? Under what circumstances is one type better than the others? 14

(b) Explain the meaning of drwxr-xr- in a UNIX system ? 6

8. Write short notes on following : 20

(i) Swapping

(ii) Disk Scheduling

(iii) Deadlock prevention

(iv) Time sharing systems

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