Printed Pages : 3

NCS401

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 110409

Roll No.

B. Tech.

(SEM. IV) THEORY EXAMINATION, 2014-15

OPERATING SYSTEM

Time : 3 Hours] [Total Marks : 100

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

1 Attempt any four questions: [5×4=20]

(a) Describe the differences symmetric and asymmetric multiprocessing.

(b) Discuss various operating system components.

(c) What are the differences between shell and kernel?

(d) Explain layered structure of an operating system. Also explain advantages and disadvantages of the layered approach to system design.

(e) What is spooling ?

(f) Explain the principle of concurrency

2 Attempt any two questions: [10×2=20]

(a) What do you understand by critical section? Discuss bakery algorithm. Also show how it satisfies the requirements of a mechanism to control access to critical section.

(b)

(c)

and a barber room with one barber chair. If there are no customers to be served, the barber goes to sleep. If a customer enters the barbershop and all chairs are occupied, then the customer leaves the shop. If the barber is busy but chairs are available, then the customer sits in one of the free chairs. If the barber is asleep, the customer wakes up the barber. Write an algorithm for the above synchronization problem using semaphores.

3 Attempt any two questions: [10×2=20]

(a) Explain the following scheduling algorithms

(i) Multilevel feedback queue scheduling

(ii) Multiprocessor Scheduling

(b) Describe Banker's algorithm for deadlock avoidance Consider a system with three process and three resources. The snapshot of a system at time t_0 is given below :

PROCESSES	ALLOCATION			MAX			AVAILABLE		
	A	B	C	A	B	C	A	B	C
P_0	2	2	3	3	6	8	7	7	10
P_1	2	0	3	4	3	3			
P_2	1	2	4	3	4	4			

(i) Is the current allocation in safe state?

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

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

(b) Process P_1 requests (1,0,0)

(c) What is a thread? How thread is different from a process? What resources are used when a thread is created?

Attempt any two questions [10×2=20]

(a) On a system using paging and segmentation, the virtual address space consists of up to 16 segments where each segment can be up to 2^{16} bytes long. The hardware pages each segment into 512 byte pages. How many bits in the virtual address specify the following?

(a) Segment Number

(b) Page Number

(c) Offset within page

(d) Entire virtual address

(b) Explain segmentation with diagram.

(c) How many page faults would occur for the following reference string for four page frames using LRU and FIFO algorithms:

1,2,3,4,5,5,3,4,1,6,7,8,7,8,9,7,8,9,5,4,5,4,2

Attempt any two questions: [10×2=20]

(a) Discuss the following terms

(i) Access Matrix.

(ii) Boot Blocks.

(b) Describe schemes for defining logical directory.

(c) Discuss disk scheduling algorithms with example.

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