Reg. No. :

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B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Third Semester

Computer Science and Engineering

14UCS305 - OPERATING SYSTEMS

(Regulation 2014)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. A parent process calling _____ system call will be suspended until children processes terminate.123456

   (a) wait   (b) fork   (c) exit   (d) exec

2. The state of a process is defined by

   (a) the final activity of the process
   (b) the activity just executed by the process
   (c) the activity to next be executed by the process
   (d) the current activity of the process

3. Which scheduling policy is most suitable for a time-shared operating system
   (a) Shortest-job First.   (b) Priority
   (c) Round-Robin.   (d) First-Come-First-Serve

4. Which time is the sum of the periods spent waiting to get into memory, waiting in the ready queue, executing on the CPU, and doing I/O.

   (a) Turnaround time   (b) Waiting time   (c) Response time   (d) Throughput

5. Consider a logical address space of eight pages of 1024 words each mapped onto a physical memory of 32 frames. How many bits are in Logical Address?

   (a) 10   (b) 12   (c) 13   (d) 15

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7. The operating system keeps the information of files in a table called

   (a) File Folder Table (FFT)   (b) File Index Table (FIT)
   (c) File Allocation Table(FAT)   (d) Directory Index Table(DIT)

8. Consider a disk with 10 blocks, where blocks 1, 4, 6, 8, 10 are free and the rest are allocated. The free space bit map would be

   (a) 1001010101   (b) 1010100101
   (c) 1001010111   (d) 0110101010

9. _____ allows modules to tell the rest of the kernel that a new driver has become available.

   (a) Module management   (b) Conflict resolution
   (c) Driver registration   (d) All the above

10. The computational technique used to compute the disk storage address of individual records is called

   (a) hashing   (b) bubble memory
   (c) dynamic reallocation   (d) key fielding

PART - B (5 x 2 = 10 Marks)

11. List the goals of operating system.

12. Describe the various operations of semaphores.

13. Differentiate internal and external fragmentation

14. If the average page faults service time of 25 ms and a memory access time of 100ns.Calculate the effective access time.

15. List the various key features of VM ware server virtualization.

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PART - C (5 x 16 = 80 Marks)

16. (a) (i) Diagrammatically illustrate and discuss the various states of a process.   (6)

    (ii) Explain how memory, I/O and CPU protection is achieved.   (10)

Or

    (b) Explain in detail about computer system organization and operating system structure with operations.   (16)

17. (a) (i) Design a software tools to solve the critical-section problem.   (8)

    (ii) Discuss implementation of the monitor mechanism using semaphores.   (8)

Or

    (b) Consider the following snapshot of a system:

Process	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

    Answer the following question using banker's algorithm: (i) what is the content of the need matrix? (ii) Is the system in a safe state? (iii) If the request from process *P1* arrives for (0, 4, 2, 0), can the request be granted immediately.   (16)

18. (a) (i) With neat diagram, Explain the process of segmentation.   (8)

    (ii) Explain in detail demand paged memory management.   (8)

Or

    (b) Explain about the concepts of virtual memory in detail.   (16)

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19. (a) Suppose that the disk drive has 5000 cylinders number 0 to 4999. The drive is currently serving a request at cylinder 143 and the previous request was at 125, the queue of the pending request in FIFO order is: 86, 1470, 913, 1174, 948, 1509, 1022, 1750,130 starting from the current head position, what is the total distance (cylinders) that the disk arm moves to satisfy all the pending requests for each of the disk scheduling algorithms. (16)

Or

(b) (i) Describe the various disk allocation methods with its merits and demerits. (10)

(ii) How reliability and protection is provided in a file system. (6)

20. (a) (i) Describe about system components in Windows 2000. (8)

(ii) Discuss how networking is implemented in Windows 2000. (8)

Or

(b) (i) State and discuss the basic principles of process management in LINUX operating system. (8)

(ii) Describe the file system of Windows in detail. (8)

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