Reg. No. : | | | | | | | | | | |

Question Paper Code: 43205

B.E. / B.Tech. DEGREE EXAMINATION, MAY 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. To avoid the race condition, the number of processes that may be simultaneously inside their critical section is.
   (a) 8 (b) 1 (c) 16 (d) 0

2. The number of processes completed per unit time is known as
   (a) output (b) throughput (c) efficiency (d) capacity

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. In an absolute loading scheme, which loader function is accomplished by assembler
   (a) Reallocation (b) Allocation
   (c) Linking (d) Loading

5. 'LRU' page replacement policy is
   (a) Last Replaced Unit. (b) Last Restored Unit
   (c) Least Recently Used (d) Least Required Unit

6. 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

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. The disadvantage of the two level directory structure is that

(a) it does not solve the name collision problem
(b) it solves the name collision problem
(c) it does not isolate users from one another
(d) it isolates users from one another

9. The design goals of Windows include (i) Extensibility (ii) Reliability (iii) Portability (iv) compatibility.

(a) (i) and (ii) only
(b) (ii) and (iii) only
(c) (i) , (ii) and (iii) only
(d) (i) , (ii), (iii) and (iv)

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. Compare user threads and kernel threads.

12. What are the various scheduling criteria for CPU Scheduling?

13. Differentiate between page and segment?

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.

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Demonstrate about the evolution of virtual machine. Also explain how virtualization could be implemented in Operating system. (8)

(ii) Enumerate different operating system structures and explain with a neat sketch. (8)

Or

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

17. (a) (i) Explain the classical problem on synchronization. (8)

(ii) Explain about monitors. (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) Illustrate contiguous memory allocation schemes, give examples. (16)

Or

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

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) Discuss in detail about types of file access. (8)

(ii) Write in detail about Free-Space management. (8)

20. (a) Explain in detail the design principles, kernel modules, process management, scheduling in LINUX system. (16)

Or

(b) (i) Describe about the network structure of LINUX system. (8)

(ii) Describe how file system is implemented in Windows. (8)