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Question Paper Code: 93C05

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

Third Semester

Computer Science and Business System

19UCB305 - Operating System Concepts

(Regulation 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Which of the following is not an operating system? CO1- U
(a) Linux (b) Oracle (c) DOS (d) Windows
2. Who provides the interface to access the services of the operating system? CO1- U
(a) API (b) System Call (c) Library (d) Assembly instruction
3. The systems which allow only one process execution at a time, are called _____. CO1- U
(a) uniprogramming systems (b) uniprocessing systems
(c) unitasking systems (d) none of the mentioned
4. What type of scheduling is round-robin scheduling? CO1- U
(a) Linear data scheduling (b) Non-linear data scheduling
(c) Preemptive scheduling (d) Non-preemptive scheduling
5. To avoid deadlock _____. CO1- U
(a) there must be a fixed number of resources to allocate
(b) resource allocation must be done only once
(c) all deadlocked processes must be aborted
(d) inversion technique can be used

6. Which one of the following is a visual (mathematical) way to determine the deadlock occurrence? CO1- U
- (a) resource allocation graph (b) starvation graph
(c) inversion graph (d) none of the mentioned
7. Which one of the following is the address generated by CPU? CO1- U
- (a) physical address (b) absolute address
(c) logical address (d) none of the mentioned
8. Memory management technique in which system stores and retrieves data from secondary storage for use in main memory is called? CO1- U
- (a) fragmentation (b) paging (c) mapping (d) none of the mentioned
9. _____ is a unique tag, usually a number identifies the file within the file system. CO1- U
- (a) File identifier (b) File name (c)File type (d) None of the mentioned
10. To create a file _____ CO1- U
- (a) allocate the space in file system
(b) make an entry for new file in directory
(c) allocate the space in file system & make an entry for new file in directory
(d) None of the mentioned

PART – B (5 x 2= 10 Marks)

11. Explain virtual machines? CO1- U
12. What are the various scheduling criteria for CPU scheduling? CO1- U
13. Name some classic problem of synchronization? CO1- U
14. What is the various Page Replacement Algorithms used for Page Replacement? CO1- U
15. What are the operations that can be performed on a Directory? CO1- U

PART – C (5 x 16= 80 Marks)

16. (a) Explain the purpose and importance of system calls and discuss the calls related to device management and Communication in brief. CO1-U (16)
- OR
- (b) Define a virtual machine (VM). With a neat diagram, illustrate the working of a VM. What are the benefits of a VM? CO1-U (16)

17. (a) Explain the FCFS, preemptive and non-preemptive versions of Shortest Job First and Round Robin (time-slice2) scheduling algorithms with Gantt Chart for the four processes given. Compare their average turn around and waiting time CO3- Ana (16)

| Process Time | Arrival Time | Burst |
|-----------------|--------------|-------|
| P1 | 0.00 | 8 |
| P2 | 1.001 | 4 |
| P3 | 2.001 | 9 |
| P4 | 3.001 | 5 |
| p5 | 4.001 | 3 |

OR

- (b) Consider the following five processes, with the length of the CPU burst time given in milliseconds. CO3- Ana (16)

| Process | Burst time |
|---------|------------|
| P1 | 10 |
| P2 | 29 |
| P3 | 3 |
| P4 | 7 |
| P5 | 12 |

Consider the First come First serve (FCFS), Non Preemptive Shortest Job First (SJF), Round Robin (RR) (quantum=10ms) scheduling algorithms. Illustrate the scheduling using Gantt chart. Which algorithm will give the minimum average waiting time? Discuss

18. (a) What is a semaphore? Explain its usage and implementation and solution to the Bounded-Buffer problem using semaphores. CO1- U (16)

OR

- (b) What is critical section problem? Apply Peterson's solution to the critical section problem CO1- U (16)

19.. (a) Explain with the help of examples FIFO and LRU, optimal page replacement algorithms with example reference string. Mention the merits and demerits of each of the above CO1- U (16)

Or

(b) Explain how paging supports virtual memory. With neat diagram explain how logical address is translated into physical address CO1- U (16)

20. (a) Explain about RAID in detail. CO1- U (16)

Or

(b) Compare the functionalities of FCFS, SSTF, C-SCAN and CLOOK with example CO1- U (16)