Reg. No. :

Question Paper Code: 93C05

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2023

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. What is bootstrapping called?   CO1- U

    (a) Cold boot   (b) Cold hot boot   (c) Cold hot strap   (d) Hot boot

2. Who provides the interface to access the services of the operating   CO1- U
    system?

    (a) API   (b) System Call   (c) Library   (d) Assembly instruction

3. The systems which allow only one process execution at a time, are   CO1- U
    called _____

    (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 about system calls?   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 various Disk-Scheduling Algorithms?   CO1- U

PART – C (5 x 16= 80 Marks)

16. (a) Analyze five services provided by an operating System. Explain how each provides convenience to the users. Explain in which cases it would be impossible for user-level Programs to provide these services.   CO3-Ana   (16)

(b) Analyze five services provided by an operating System. Explain how each provides convenience to the users. Explain in which cases it would be impossible for user-level Programs to provide these services.   CO3-Ana   (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	Arrival Time	Burst Time
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, optical 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 hoe logical address is translated into physical address — CO1- U — (16)

20. (a) Compare the functionalities of FCFS, SSTF, C-SCAN and CLOOK with example — CO3- Ana — (16)

Or

(b) Suppose the head of a moving- head disk with 200 tracks, numbered 0 to 199, is Currently serving a request at track 143 and has just finished a request at track 125. If the queue of requests is kept in FIFO order: 86, 147, 91, 177, 94, 150, 102, 175, 130. What is the total head movement to satisfy these requests for the following Disk scheduling algorithms.
(a)FCFS (b) Random (d) SCAN (e) SSTF (f) C- SCAN — CO3- Ana — (16)