B.Tech. DEGREE EXAMINATION, NOVEMBER 2023
Fourth Semester

18CSC266J – OPERATING SYSTEMS
(For the candidates admitted from the academic year 2020-2021 & 2021-2022)

Note:
(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
(ii) **Part - B & Part - C** should be answered in answer booklet.

Time: 3 hours

Max. Marks: 100

PART – A (20 × 1 = 20 Marks)
Answer ALL Questions

		Marks	BL	CO	PO

1. In a time-sharing operating system, when the time slot given to process is completed, the process goes from the running state to the — Marks 1, BL 1, CO 1, PO 1
   (A) Blocked state
   (B) Ready state
   (C) Suspended state
   (D) Terminated state

2. What is the objective of multiprogramming? — Marks 1, BL 1, CO 1, PO 1
   (A) Have a process running at all time
   (B) Have multiple programs waiting in a ready queue to run
   (C) To increase CPU utilization
   (D) To reduce the through put

3. A parent process calling _____ system call will be suspended until children processes terminate — Marks 1, BL 1, CO 1, PO 1
   (A) wait
   (B) fork
   (C) exit
   (D) exec

4. The child process can _____. — Marks 1, BL 1, CO 1, PO 1
   (A) Be a duplicate of the parent process
   (B) Never be a duplicate of the parent process
   (C) Not have another program loaded into it
   (D) Never have another program loaded into it

5. Thread shares with other threads belonging to the same process its — Marks 1, BL 1, CO 2, PO 1
   (A) Thread ID
   (B) Program counter
   (C) Register set and a stack
   (D) Code section and data section

6. The process is swapped out of memory, and is later swapped into memory, by the _____. — Marks 1, BL 1, CO 2, PO 1
   (A) Long-term scheduler
   (B) Short-term scheduler
   (C) Medium-term scheduler
   (D) Not by the scheduler

7. Which of the following scheduling algorithm is non-preemptive? — Marks 1, BL 1, CO 2, PO 1
   (A) SJF scheduling
   (B) FCFS scheduling
   (C) Priority scheduling
   (D) Round-Robin scheduling

8. The _____ is a special case of the general priority-scheduling algorithm.   1 1 2 1
   (A) FCFS scheduling   (B) RR scheduling
   (C) FCLS scheduling   (D) SJF scheduling

9. Which command is used for printing the current working directory?   1 1 3 1
   (A) dir   (B) HOME
   (C) cd   (D) pwd

10. The UNIX shell is both _____ and _____ language.   1 1 3 1
    (A) Interactive, responsive   (B) Interpreter, executing
    (C) Scripting, interpreter   (D) High level, low level

11. What are the two kinds of semaphores?   1 1 3 1
    (A) Mutex and counting   (B) Binary and counting
    (C) Counting and decimal   (D) Decimal and binary

12. A procedure defined within a _____ can access only those variables declared locally within the _____ and its formal parameters.   1 2 3 1
    (A) Process, semaphore   (B) Process, monitor
    (C) Monitor, monitor   (D) Semaphore, semaphore

13. To avoid deadlock _____.   1 2 4 1
    (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

14. The address of a page table in memory is pointed by _____.   1 2 4 1
    (A) Stack pointer   (B) Page table base register
    (C) Page register   (D) Program counter

15. When the memory allocated to a process is slightly larger than the process, then _____.   1 2 4 1
    (A) Internal fragmentation occurs   (B) External fragmentation occurs
    (C) Both internal and external fragmentation occurs   (D) Neither internal nor external fragmentation occurs

16. When there is a large logical address space, the best way of paging would be _____.   1 2 4 1
    (A) Not to page   (B) A two level paging algorithm
    (C) The page table itself   (D) Page table

17. In segmentation, each address is specified by _____.   1 2 5 1
    (A) An offset and value   (B) A value and segment number
    (C) A segment number and offset   (D) A key and value

18. Which of the following file operation is also known as file seek?   1 1 5 1
    (A) Truncating a file   (B) Deleting file
    (C) Repositioning with in a file   (D) Reading a file

19. In the _____ algorithm, the disk arm goes as far as the final request in each direction, the reverses direction immediately without going to the end of the disk.   1 2 5 1
    (A) Look
    (B) Scan
    (C) C-Scan
    (D) C-Look

20. The time taken to move the disk arm to the desired cylinder is called the _____.   1 2 5 1
    (A) Positioning time
    (B) Random access time
    (C) Seek time
    (D) Rotation latency

PART – B (5 × 4 = 20 Marks)
Answer ANY FIVE Questions

	Marks	BL	CO	PO

21. Distinguish multiprogramming and time sharing environment.   4 4 1 1

22. What is the average turnaround time for the following processes using   4 4 2 2
    (i)   FCFS   (ii) Preemptive SJF

Process	Arrival time	Burst time
P1	0.0	8
P2	0.4	4
P3	1.0	1

23. Explain the dining-philosopher critical section problem solution using monitor.   4 3 3 2

24. State and explain in detail about swapping in storage management system with example.   4 3 4 2

25. Discuss disk scheduling algorithms in detail.   4 3 5 2

26. Explain the components of Linus system with neat sketch.   4 2 2 1

27. Describe the features of the layered approach type of operating systems structures.   4 2 .1 1

PART – C (5 × 12 = 60 Marks)
Answer ALL Questions

	Marks	BL	CO	PO

28. a. Describe the features of the following types of operating systems structures   12 3 1 1
    (i)   Micro kernal system structure
    (ii)   Modules

(OR)

    b. Describe system calls and system programs in detail with neat sketch.   12 3 1 1

29. a. Explain the differences in the degree to which of the following scheduling algorithm discriminate in favor of short processes: 12 5 2 2
    (i)   RR
    (ii)   Multilevel feedback queues

(OR)

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b. Explain in detail about rate monotonic scheduling and earliest deadline first scheduling with example.   12   5   2   2

30. a. What are the classical problems of synchronization? State and explain any one of the problem with example.   12   5   3   2

(OR)

b. Explain deadlock avoidance using banker's algorithm in detail with suitable examples.   12   5   3   2

31. a. Free memory holes of sizes 15K, 10K, 5K, 25K, 30K, 40K are available. The process of size 12K, 2K, 25K, 20K is to be allocated. How processes are placed in first fit, best fits, worst fit. Calculate internal as well as external fragmentation.   12   5   4   2

(OR)

b. Calculate page faults for (LRU, FIFO, OPT) for the following sequences where page frame is three.   12   5   4   4
     0, 1, 2, 1, 4, 2, 3, 7, 2, 1, 3, 5, 1, 2, 5

32. a. State and explain the following disk scheduling   12   4   5   2
     (i)   FCFS
     (ii)   SSTF
     (iii)   SCAN
     (iv)   C-SCAN
     (v)   LOOK

(OR)

b.i. State and explain the swap space management.   5   3   5   2

ii. Explain in detail about file system implementation using linked list with index and i-node.   7   4   5   2

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