(i) Draw Gantt chart for SJF and Round Robin (time quantum = 1)
(ii) Calculate average waiting time
(iii) Calculate average turnaround time

(OR)

b. Consider the following processes with CPU burst in milliseconds 12 3 2 2

Process	Burst time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

Assume lower number indicates higher priority. Using priority scheduling (pre-emptive), do the following
(i) Draw Gantt chart
(ii) Calculate average waiting time
(iii) Calculate average turnaround time

30. a. Discuss the following memory allocation technique in detail. 12 3 3 2
(i) First fit
(ii) Best fit
(iii) Worst fit
(iv) Next fit

(OR)

b. Illustrate the paging technique in intel architecture with neat diagram. 12 3 3 1

31. a. Consider the following page reference string. 12 4 4 3
1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5, 4, 2.
Find the number of page faults for LRU and FIFO page replacement algorithms.

(OR)

b. Discuss the following page replacement algorithm in detail 12 3 4 3
(i) Optimal page replacement
(ii) Most frequently used page replacement

32. a. Suppose a disk has 400 cylinders numbered 0 to 399. The driver is currently services a request at cylinder 143 and previous request was to cylinder125. The queue of pending request in FIFO order is 86, 147, 312, 91, 177, 48, 309, 222, 175, 130. 12 4 5 4
Find the total cylinder movement for the following scheduling algorithms.
(i) SSTS
(ii) SCAN
(iii) C-SCAN

(OR)

b. Discuss in detail about the following 12 3 5 4
(i) Free space management
(ii) Swap space management

* * * * *

Reg. No.															

B.Tech. DEGREE EXAMINATION, JUNE 2023
Fourth Semester

18CSC205J – OPERATING SYSTEMS
(For the candidates admitted during the academic year 2018-2019 to 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. Which of the following is not a real time operating system? (A) Vx works (B) Windows CE (C) RT Linux (D) Palm OS	1	1	1	1
2. If a process is executing in its critical section, then no other processes can be executing in its critical section. This condition is called (A) Race condition (B) Process exclusion (C) Mutual exclusion (D) Starvation	1	2	1	1
3. A process executes the following code for (i = 0; i < n; i++) fork ( ); How many child processes will be created? (A) n (B) 2n (C) 2n–1 (D) 2n+1	1	3	1	3
4. The time taken to switch between user and kernel nodes of execution be t2, while the time taken to switch between two processes be t1. Which of the following is true? (A) t1 < t2 (B) t1 > t2 (C) t1 = t2 (D) Cannot say any relation between t1 and t2	1	2	1	3
5. Process synchronization can be done on _____. (A) Software level (B) Hardware level (C) Both hardware and software level (D) Process level	1	2	2	1
6. Peterson solution is restricted to _____ processes that alternate execution between their critical section and remainder section. (A) Four (B) Two (C) Three (D) Five	1	2	2	2
7. Which of the following is not a condition for deadlock? (A) Mutual exclusion (B) Hold and wait (C) Preemption (D) Circular wait	1	1	2	3

8. The number of processes that are completed per unit time is called 1 2 2 1
   (A) Throughput (B) Turnaround time
   (C) Response time (D) CPU utilization

9. What is compaction? 1 2 3 1
   (A) Technique for overcoming internal fragmentation (B) Technique for overcoming external fragmentation
   (C) Technique for overcoming fatal error (D) Technique for overcoming page fault

10. Smaller page tables are implemented as a set of _____. 1 1 3 2
   (A) Queues (B) Stacks
   (C) Counters (D) Registers

11. If there are 32 segments, each of size 1 KB, then the logical address should have _____ bits. 1 3 3 3
   (A) 13 (B) 14
   (C) 15 (D) 16

12. A _____ is a continuous virtual memory block with a set length. 1 2 3 1
   (A) Frame (B) Ram block
   (C) Memory frame (D) Page

13. _____ abstracts main memory into an extremely large, uniform array of storage, separating logical memory as viewed by the user from physical memory 1 2 4 1
   (A) Virtual memory (B) Main memory
   (C) Paging (D) Page table

14. Page fault occurs when _____. 1 2 4 2
   (A) The page is in the memory (B) The process enters into blocked state
   (C) The process is in ready state (D) The page is not in the memory

15. When a process is swapped in, its pages are not swapped in all at once. Rather they are swapped in only when the process needs then. This method is called 1 2 4 3
   (A) Busy swapper (B) Lazy swapper
   (C) Smart swapper (D) Late swapper

16. Working set model for page replacement is based on the assumption of _____. 1 2 4 1
   (A) Random access (B) Modularity
   (C) Globalization (D) Locality

17. The _____ is the additional time for the disk to rotate the desired sector to the disk head. 1 1 5 3
   (A) Disk arm (B) Track
   (C) Cylinder (D) Sector

18. The operating system keeps a small table containing information about all open files is called 1 1 5 4
   (A) Open file table (B) System table
   (C) File table (D) Directory table

19. Free space list cannot be implemented as 1 3 5 4
   (A) Bit map (B) Grouping
   (C) Indexed (D) Counting

20. Suppose requests have recently arrived for data on cylinders 25, 46, 12 and 3 in order. The read-write head in currently at cylinder 20. If SSTF scheduling in used, then the requests will be serviced in the order. 1 2 5 4
   (A) 25, 46, 12, 3 (B) 25, 46, 3, 12
   (C) 3, 12, 25, 46 (D) 25, 13, 3, 46

PART – B (5 × 4 = 20 Marks) Marks BL CO PO
Answer **ANY FIVE** Questions

21. Discuss the role of operating system from different perspective. 4 1 1 1

22. What do you mean by operating processes? Describe its four advantages. 4 2 1 1

23. What do you mean by PCB? Where it is used? What are its contents? 4 2 2 2

24. Give difference between job scheduling and CPU scheduling. 4 2 2 3

25. With a neat diagram, discuss the steps involved in handling a page fault. 4 2 3 2

26. What is thrashing? What are the causes of thrashing? 4 2 4 3

27. Differentiate between protection and security in file system. How they are implemented? 4 3 5 4

PART – C (5 × 12 = 60 Marks) Marks BL CO PO
Answer **ALL** Questions

28. a. Differentiate among the following types of OS by defining their essential properties 12 2 1 1
   (i) Time sharing (ii) Batch system (iii) Real time (iv) Embedded

(OR)

   b. Discuss the essential features of the following structure of operating systems 12 2 1 3
   (i) Monolithic system (ii) Micro kernels
   (iii) Virtual machines (iv) Layered systems

29. a. Consider the following processes of CPU burst in milliseconds. All processes arrived at the same time in order P1, P2, P3 and P4 12 3 2 2

Process	Burst time
P1	5
P2	10
P3	2
P4	1