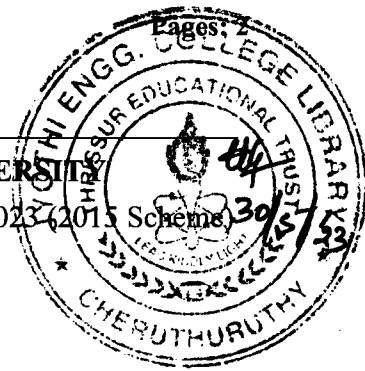


Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

B.Tech Degree S4 (S, FE) / S4 (PT) (S, FE) Examination May 2023 (2015 Scheme)

**Course Code: CS204****Course Name: OPERATING SYSTEMS (CS)**

Max. Marks: 100

Duration: 3 Hours

**PART A***Answer all questions. Each carries 3 marks.*

- |   |    |   |   |
|---|----|---|---|
| 1 | a) | What is an Operating System (OS)? List any three functions of OS.   | 3 |
| 2 | a) | Explain system call with an example.                                | 3 |
| 3 | a) | What is a Process Control Block (PCB).                              | 3 |
| 4 | a) | Differentiate between single threaded and multi-threaded processes? | 3 |

**PART B***Answer any two questions. Each carries 9 marks.*

- |   |    |  |   |
|---|----|--|---|
| 5 | a) | Differentiate between Monolithic and Micro kernel Design of OS | 6 |
|   | b) | What are the three advantages of Multiprocessor Systems?       | 3 |
| 6 | a) | List the criteria for CPU scheduling? Explain each.            | 6 |
|   | b) | What do you mean by context switching? Explain.                | 3 |
| 7 | a) | Explain the different states of a process with a diagram.      | 6 |
|   | b) | What is the use of pipe in message passing?                    | 3 |

**PART C***Answer all questions. Each carries 3 marks.*

- |    |    |  |   |
|----|----|--|---|
| 8  | a) | Explain the wait and signal operations in Semaphore?                 | 3 |
| 9  | a) | What is a critical section?  | 3 |
| 10 | a) | Explain pre-emptive scheduling with an example.                      | 3 |
| 11 | a) | What are the necessary conditions for deadlock to occur in a system? | 3 |

**PART D***Answer any two questions. Each carries 9 marks.*

- |    |     |   |   |
|----|-----|---|---|
| 12 | a)  | Explain any three classical problems of synchronisation.  | 9 |
| 13 | a)  | Draw the Gantt Chart, find the average waiting time and average turnaround time of the following scheduling algorithms. | 9 |
|    | i)  | SJF   |   |
|    | ii) | Priority  |   |

Process	Arrival Time ( ms )	Burst Time ( ms )	Priority
P0	2	7	2
P1	0	4	4
P2	4	3	1
P3	5	5	3

- 14 a) Explain deadlock avoidance using Banker's algorithm.

9

### PART E

*Answer any four questions. Each carries 10 marks.*

- 15 a) Explain the difference between internal and external fragmentation. 5  
 b) Explain the process of Swapping with a diagram. 5
- 16 a) Explain the concept of paging with a diagram. 10
- 17 a) Explain the following page replacement algorithms with an example. 10  
 i) LRU replacement  
 ii) FIFO replacement  
 iii) Optimal replacement.
- 18 a) What are the different file allocation methods? 10
- 19 a) Explain FCFS, SCAN and C-SCAN disk scheduling algorithms, using the given disk queue of requests: 98, 183, 37, 122, 14, 124, 65 and 67. Assume that, the disk has 200 platters ranging from 0 to 199 and the current position of head is at cylinder 53. 10
- 20 a) How access matrix is used as a protection mechanism? 10