

5E1353

Roll No. \_\_\_\_\_

Total No. of Pages: 3

5E1353

B. Tech. V - Sem. (Main / Back) Exam., January - 2022  
Computer Science & Engineering  
5CS4 - 03 Operating System  
CS, IT

Time: 3 Hours

Maximum Marks: 120  
Min. Passing Marks: 42

*Instructions to Candidates:*

*Attempt all ten questions from Part A, five questions out of seven questions from Part B and four questions out of five from Part C.*

*Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.*

*Use of following supporting material is permitted during examination. (Mentioned in form No. 205)*

1. NIL

2. NIL

**PART - A**

**(Answer should be given up to 25 words only)**

**[10×2=20]**

**All questions are compulsory**

Q.1 What is kernel?

Q.2 What is thread?

Q.3 What is deadlock?

Q.4 Define logical and physical address.

Q.5 What are context switches?

ersahilkagyan.com

- Q.6 Differentiate between pager and swapper.  
Q.7 Explain the features of Operating System.  
Q.8 What are frames?  
Q.9 What is thrashing?  
Q.10 Explain 'valid' and 'invalid' bit in page table.

**PART - B**

**(Analytical/Problem solving questions)**

**[5×8=40]**

**Attempt any five questions**

- Q.1 What are preemptive and non-preemptive scheduling process? Explain the process state diagram in detail.
- Q.2 What are the necessary conditions for deadlock? Explain resource graph model and safe-unsafe states with a suitable example.
- Q.3 Explain the followings -
- (a) Inter-process Communication.
  - (b) Mutual Exclusion and Race Condition.
  - (c) Critical Section.
- Q.4 What do you mean by demand paging? Explain virtual memory and page fault concept in detail.
- Q.5 What is file management? Explain its types and structures.
- Q.6 Differentiate between Windows and Linux based operating system.
- Q.7 What is Memory Management Unit (MMU)? Explain Best Fit, Worst Fit and Quick Fit Algorithms in detail.

## PART - C

(Descriptive/Analytical/Problem Solving/Design Questions)

[4×15=60]

Attempt any four questions

- Q.1 Consider the following page reference string 1, 2, 3, 4, 1, 2, 5, 1, 2, 3, 4, 5  
Compare the number of page faults with frame size 3, 4 with FIFO & LRU page replacement algorithm. Also explain Belady's anomaly in detail.
- Q.2 (a) Explain the difference between long term, short term and medium term schedulers.  
(b) Explain the layered approach of the Operating System.
- Q.3 For the following set of process, find the average waiting time and turn around time using Gantt chart for –
- (a) SJF  
(b) Priority scheduling process

Process	Burst time (ms)	Priority
P1	5	5
P2	3	4
P3	8	3
P4	2	1
P5	1	2

- Q.4 Suppose a disk drive has 200 cylinders. The drive is initially at cylinder position 98.

The queue with request from I/O to blocks on cylinders –

86, 147, 91, 177, 94, 150, 102, 175, 130

6, 91, 94, 98, 102, 130, 141, 150, 175

What is the total head movement needed to satisfy the request for SCAN and C-SCAN scheduling algorithm?

- Q.5 Explain the followings –

- (a) Data Structure of Bankers Algorithm  
(b) Segmentation  
(c) File Security