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?

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)

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
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
