EVEN 2024-25 CO23109

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : **Computer Engineering (Sandwich Pattern)**
Course Title : **Operating System**

2:30 Hours / 60 marks Enrolment No. F D 2 4 I F 0 0 1

***Instructions*:**
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO=COURSE OUTCOMES, L=LEVELS

Q.1 Attempt any SIX **12 Marks**

a. List different types of operating system. **[CO-1, L-R]**
b. Draw a neat diagram for PCB & state its fields. **[CO-3, L-A]**
c. Define the term: Thread, Kernel. **[CO-3, L-R]**
d. State two features of non- preemptive scheduling. **[CO-4, L-U]**
e. State the concept of deadlock. **[CO-4, L-U]**
f. Define virtual memory. **[CO-5, L-R]**
g. State the terms i) Memory Compaction ii) Fragmentation. **[CO-5, L-R]**
h. List any four file operations. **[CO-6, L-R]**
i. Describe any four file attributes. **[CO-6, L-R]**

Q.2 Attempt any THREE **12 Marks**

a. Differentiate between multitasking & multiprogramming. **[CO-1, L-A]**
b. Explain system calls used in process control. **[CO-2, L-U]**
c. Explain Round Robin Algorithm & calculate average waiting time for the following table 1. Consider time quantum = 2 ms **[CO-4, L-A]**

Process	Burst time
P1	6
P2	8
P3	7
P4	3

CT TAT WT
→ 12.4.

d. Describe any four conditions for deadlock occurrence. **[CO-4, L-U]**

Q. 3 Attempt any THREE **12 Marks**

a. Explain process management & main memory management components with respect to activities. **[CO-2, L-U]**
b. Describe the term inter process Communication. Explain any one technique for IPC. **[CO-3, L-U]**
c. Compare the shortest job first (SJF) & Shortest Remaining Time (SRT) scheduling algorithm. **[CO-4, L-A]**
d. Describe single level & two level directory structure. **[CO-6, L-U]**

Q. 4 Attempt any FOUR **12 Marks**

a. List & describe any four services of operating system. **[CO-1, L-U]**

b. Explain the use of following OS tools.
i) Device Manager ii) Task Manager **[CO-2, L-U]**

c. Describe how context switching is executed by operating system. **[CO-3, L-A]**

d. Describe the concept of segmentation in operating system with suitable example. **[CO-5, L-U]**

e. Define fragmentation. Explain internal & external fragmentation. **[CO-5, L-U]**

Q. 5 Attempt any TWO **12 Marks**

a. Consider the processes P1, P2, P3 & P4 with length of CPU burst time. Find out average waiting time & average turnaround time for the SJF algorithm. (use following table 2) **[CO-4, L-A]**

Process	Arrival Time	Burst time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

WT=10

b. Differentiate between Paging & Segmentation (any six points) **[CO-5, L-A]**

c. Given a page reference string with (03) pages frames. Calculate the page fault with optimal & LRU page replacement algorithm respectively.
7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7; **[CO-5, L-A]**

12
8

****End****