University of Mumbai
Examination May 2022
Program: **Information Technology**
Curriculum Scheme: Rev 2019
Examination: SE Semester IV

Paper code - 93638

Course Code: ITC403
Time: 2 hour 30 minutes

Course Name: Operating System
Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Symmetric multiprocessing architecture of computer system uses shared ------
Option A:	Processors, Memory
Option B:	Memory, Bus
Option C:	Bus
Option D:	Hard drives
2.	Aging is called as------
Option A:	Increasing the time of execution
Option B:	Increasing the priority of a process
Option C:	Decreasing the priority of a process
Option D:	Drawback of FCFS
3.	Suppose that a process is in "Blocked" state waiting for some I/O service. When the service is completed, it goes to the------------
Option A:	Running state
Option B:	Ready State
Option C:	Terminated state
Option D:	Suspended state
4.	Which one of the following is not true?
Option A:	kernel is the program that constitutes the central core of the operating system
Option B:	kernel is the first part of operating system to load into memory during booting
Option C:	kernel is made of various modules which can not be loaded in running operating system
Option D:	kernel remains in the memory during the entire computer session
5.	Which of the statement is true in case of PCB
Option A:	PCB is used to identify process area
Option B:	PCB is created per process which is used to store relevant information about process.
Option C:	PCB is created to store process in user area.
Option D:	PCB is used by user to access process code and data.
6.	Resource request is done in particular order to avoid -----
Option A:	Deadlock ✓
Option B:	Confusion
Option C:	Overhead on OS
Option D:	Resource conflict
7.	-------is generally faster than ------ and -----.
Option A:	First fit, best fit, worst fit

Option B:	Best fit, first fit, worst fit
Option C:	Worst fit, best fit, first fit
Option D:	Worst fit, first fit, best fit
8.	In the _____ algorithm, the disk arm starts at one end of the disk and moves toward the other end, servicing requests till the other end of the disk. At the other end, the direction is reversed and servicing continues.
Option A:	LOOK
Option B:	SCAN
Option C:	C-SCAN
Option D:	C-LOOK
9.	Run time mapping from virtual to physical address is done by _____
Option A:	Memory management unit
Option B:	CPU
Option C:	PCI
Option D:	API
10.	Consider the following set of processes, the length of the CPU burst time given in milliseconds. Process Burst time P1- 24, P2- 3, P3- 7, P4- 13, P5- 21. Assuming the above process being scheduled with the SJF scheduling algorithm, which of the following statement is true?
Option A:	The waiting time for the process P5 is 10 ms
Option B:	The waiting time for the process P5 is 0 ms
Option C:	The waiting time for the process P5 is 44 ms
Option D:	The waiting time for the process P5 is 23 ms

Q. 2	Solve any Two Questions out of Three, 10 marks each
A	What is Internal fragmentation? Explain static partitioned allocation with partition sizes 400,180, 100,300,45. Assuming First fit and Best fit method indicate the memory status after memory request for sizes 95, 180, 285, 380, 30.
B	Give the explanation of necessary conditions for deadlock. Explain how a resource allocation graph determines a deadlock.
C	Consider the page reference string 1,2,3,5,2,4,5,6,2,1,2,3,7,6,3,2,1,2,3,6. Calculate the Page fault using 1. Optimal 2. LRU 3. FIFO algorithms for a memory with three frames. 12 8 14 6 15 5

Q. 3	Solve any Four Questions out of Six, 5 marks each
A	What are the various objectives and functions of Operating Systems? ·
B	Differentiate between process and threads.
C	What is virtual memory? Mention its advantages.
D	Explain about file attributes, file operations, and file types. ·
E	Explain about Resource Allocation Graph (RAG). ·
F	What are various features of Mobile and Real Time Operating Systems? ·

Q. 4	Solve any Two Questions out of Three, 10 marks each
A	Suppose the head of a moving disk with 200 tracks, numbered 0 to 199, is Currently serving a request at track 143 and has just finished a request at track 125. If the queue of requests is kept in FIFO order: 86, 147, 91, 177, 94, 150, 102, 175, 130. What is the total head movement to satisfy these requests for the following Disk scheduling algorithms. (a)FCFS (b)SSTF (c) C- SCAN

B	Consider the following five processes, with the length of the CPU burst time given in milliseconds. Process Burst time is P1-10, P2-29, P3-3, P4-7,P5-12. Consider the First come First serve (FCFS), Non Preemptive Shortest Job First(SJF), Round Robin(RR) (quantum=10ms) scheduling algorithms. Illustrate the scheduling using Gantt chart. Calculate the Average Waiting Time and Turn Around Time.
C	What is semaphore and its types? How the classic synchronization problem - Dining philosopher is solved using semaphores?