

# University of Mumbai

## Examination June 2021

Examinations Commencing from 1<sup>st</sup> June 2021

Program: **Information Technology**

Curriculum Scheme: **Rev2019**

Examination: BE Semester IV

Course Code: **ITC 403** and Course Name: **OPERATING SYSTEM**

Time: 2 hour

Max. Marks: 80

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Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	Which of the following provide system resource access to virtual machines?
Option A:	VMM
Option B:	VMC
Option C:	VNM
Option D:	VMN
2.	What else is a command interpreter called?
Option A:	Prompt
Option B:	Kernel
Option C:	Shell
Option D:	Command
3.	File virus attaches itself to the _____
Option A:	source file
Option B:	object file
Option C:	executable file
Option D:	Multiple file
4.	_____ is when multiple jobs are executed by the CPU simultaneously by switching between them.
Option A:	Multiprogramming
Option B:	Multitasking
Option C:	Distributed Environment
Option D:	Spooling
5.	Mapping of file is managed by _____
Option A:	file metadata
Option B:	page table
Option C:	virtual memory
Option D:	file system
6.	Random access in magnetic tapes is _____ compared to magnetic disks.
Option A:	Fast
Option B:	very fast

Option C:	Slow
Option D:	very slow
7.	The solution to the problem of reliability is the introduction of
Option A:	Aging
Option B:	Scheduling
Option C:	Redundancy
Option D:	Disks
8.	When the valid – invalid bit is set to valid, it means that the associated page
Option A:	is in the TLB
Option B:	has data in it
Option C:	is in the process's logical address space
Option D:	is the system's physical address space
9.	In a paged memory, the page hit ratio is 0.35. The required to access a page in secondary memory is equal to 100 ns. The time required to access a page in primary memory is 10 ns. The average time required to access a page is?
Option A:	3.0 ns
Option B:	68.0 ns
Option C:	68.5 ns
Option D:	78.5 ns
10.	The offset 'd' of the logical address must be
Option A:	greater than segment limit
Option B:	between 0 and segment limit
Option C:	between 0 and the segment number
Option D:	greater than the segment number
11.	Virtual memory allows
Option A:	execution of a process that may not be completely in memory
Option B:	a program to be smaller than the physical memory
Option C:	a program to be larger than the secondary storage
Option D:	execution of a process without being in physical memory
12.	The aim of creating page replacement algorithms is to
Option A:	replace pages faster
Option B:	increase the page fault rate
Option C:	decrease the page fault rate
Option D:	to allocate multiple pages to processes
13.	What are the characteristics of processor in distributed system?
Option A:	They vary in size and function
Option B:	They are same in size and function
Option C:	They are manufactured with single purpose
Option D:	They are real-time devices
14.	Which is NOT an example of state information?
Option A:	Mounting information

Option B:	Description of HDD space
Option C:	Session keys
Option D:	Lock status
15.	Which of the following Multithreading model, the entire process will block if a thread makes a blocking system call.
Option A:	Many to One model
Option B:	One to Many model
Option C:	Many to Many model
Option D:	One to One model
16.	After fork() system call, one of the two processes typically uses the _____ system call to replace the process's memory space with a new program.
Option A:	Exit
Option B:	Init
Option C:	Wait
Option D:	Exec
17.	Copying a process from memory to disk to allow space for other processes is called
Option A:	Swapping
Option B:	Deadlock
Option C:	Demand paging
Option D:	Page fault
18.	For long-term scheduler which of the following stand TRUE i. The long term scheduler executes much less frequently. ii. Because of the longer interval between executions, the long-term scheduler can afford to take more time to decide which process should be selected for execution. iii. Because of the smaller interval between executions, the long-term scheduler can afford to take less time to decide which process should be selected for execution. iv. The long-term scheduler executes more frequently.
Option A:	i, ii only
Option B:	i only
Option C:	i & iv only
Option D:	i, ii & iii only
19.	Kernel threads
Option A:	Cannot be supported & managed directly by the OS.
Option B:	Can be supported & managed directly by the OS.
Option C:	Are managed below the kernel & are managed without kernel support
Option D:	Are managed above the kernel & are managed with kernel support
20.	Which of the following Multithreading model maps many user-level threads to one kernel thread.
Option A:	Many to One Model
Option B:	One to Many Model

Option C:	Many to Many Model
Option D:	One to One Model

<b>Q2</b>	<b>Solve any Two Questions out of Three</b> <span style="float: right;"><b>10 marks each</b></span>
A	What is an Operating System? What is the need for an operating system? Discuss the major functions of an operating system with example.
B	<p>What is page replacement? Consider the following reference string</p> <p>7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1</p> <p>Find the number of page Faults with FIFO, Optimal Page replacement and LRU with four free frames which are empty initially. Which algorithm gives the minimum number of page faults?</p>
C	Describe difference among short-term, medium-term and long-term scheduling.

<b>Q3.</b>	<b>Solve any Two Questions out of Three</b> <span style="float: right;"><b>10 marks each</b></span>												
A	Explain RAID Level in Details												
B	Compare State full Server v/s Stateless Server with a proper example.												
C	<p>Consider the following set of processes, with the length of CPU burst given in mili seconds. The processes are assumed to have arrived order P1, P2, P3.</p> <p>Calculate the average turnaround time and average waiting time for FCFS &amp; SJF algorithm. Also draw Gantt Chart.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>PROCESS</th> <th>BURST TIME</th> <th>ARRIVAL TIME</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>15</td> <td>0</td> </tr> <tr> <td>P2</td> <td>5</td> <td>0</td> </tr> <tr> <td>P3</td> <td>13</td> <td>0</td> </tr> </tbody> </table>	PROCESS	BURST TIME	ARRIVAL TIME	P1	15	0	P2	5	0	P3	13	0
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