

# University of Mumbai

Examinations Commencing from 17<sup>th</sup> May 2022

Program: Artificial Intelligence and Data Science

Curriculum Scheme: Rev 2019

Semester:IV

Examination:SE

Course Code: CSC404

Course Name:Operating Systems

Time: 2 1/2hour

Max.Marks:80

Q1.	Choosethecorrectoptionforfollowingquestions.AlltheQuestionsarecompulsoryand carry equal marks (20 marks)
1.	What is deadlock?
OptionA:	A condition where each process is blocked and waiting for others to release resources
OptionB:	Condition where each process is terminated and started again
OptionC:	Condition where each process is ready to be executed one by one
OptionD:	Condition where each process is blocked except child process
2.	How much time will spend when <u>LRU</u> replaces the page?
OptionA:	shortest time in memory
OptionB:	shortest time in memory without being referenced
OptionC:	longest time in memory
OptionD:	longest time in memory without being referenced
3.	In operating system, each process has its own _____
OptionA:	address space and global variables
OptionB:	open files
OptionC:	pending alarms, signals and signal handlers
OptionD:	all of the mentioned
4.	In Unix, Which system call creates the new process?
OptionA:	fork
OptionB:	create
OptionC:	new
OptionD:	none of the mentioned
5.	A system is in safe state if -----
OptionA:	The system can allocate resources to each process in some order and still avoid deadlock
OptionB:	There exist a safe sequence
OptionC:	all of the mentioned
OptionD:	none of the mentioned
6.	Memory fragmentation results in
OptionA:	Stack Overflow
OptionB:	Page faults
OptionC:	Better utilization of memory
OptionD:	Poor utilization of memory

7.	In-----memory binding are changed in such manner that all free memory area can be merged to form a single free memory area
OptionA:	Memory paging
OptionB:	Memory Swapping
OptionC:	Memory Compaction
OptionD:	Memory Segmentation
8.	LRU page – replacement algorithm associates with each page the _____
OptionA:	time it was brought into memory
OptionB:	the time of that page’s last use
OptionC:	page after and before it
OptionD:	all of the mentioned
9.	The aim of creating page replacement algorithms is to _____
OptionA:	replace pages faster
OptionB:	increase the page fault rate
OptionC:	decrease the page fault rate
OptionD:	to allocate multiple pages to processes
10.	Internal fragmentation occurs when a
OptionA:	Memory area remain unused because it is too large to be allocated
OptionB:	Memory area remain unused because it is too small to be allocated
OptionC:	More memory is allocated than requested by the process
OptionD:	Less memory is allocated than requested by the process

<b>Q2</b>	<b>Solve any Four out of Six (5markseach) 20Marks</b>
A	Define Operating System?Brief functions of Operating System?
B	Explain Thrashing?Discuss various scheduling criteria?
C	Suppose that a disk drive has 5000 cylinders numbered 0 to 4999.The drive is currently serving a request at cylinder 143,and previous request was at cylinder 125.The queue of pending request was at cylinder 125.The queue of pending requests in FFO is ordered as 80,1470,913,1777,948,1022,1750,130.What is the total distance that disk arm moves for following by applying following algorithms? 1.FCFS 2.SSTF 3.LOOK 4.SCAN
D	Explain synchronization problem?What is producer consumer problem how to solve it?
E	Explain Bankers algorithm in detail?
F	Write short note on-Disk scheduling algorithms.

<b>Q3.</b>	<b>SolveanyTwo Questions out of Three.(10 marks each)20Marks</b>
A	Given memory partitions of 150k,500k,200k,300k,550k(in order) how each of first fit,best fit and worst fit algorithm places the processes of 220k,430k,110k,425k.Evaluate which algorithm makes more efficient use of memory?

B	Calculate number of page faults and page hits for page replacement policies FIFO,Optimal and LRU for given reference string 6,0,5,2,0,3,0,4,2,3,0,3,2,5,2,0,5,6,0,5(assuming three frame size)?
C	What is Deadlock?Explain necessary conditions for deadlocks.what is the difference between deadlock avoidance and prevention?

<b>Q4.</b>	<b>Solve any Two Questions out of Three. (10 mark each) 20 Marks</b>
A	
B	
C	