LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **COMPUTER SCIENCE**

SECOND SEMESTER – **APRIL 2023**

UCS 2503/UCA 2501 – OPERATING SYSTEM

Date: 29-04-2023 Dept. No. Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

	SECTION A - K1 (CO1)
	Answer ALL the Questions **(10 x 1 = 10)**
1.	**Answer the following**
a)	List the operating system components.
b)	Define Deadlock.
c)	Define First Fit and Best Fit allocation methods.
d)	What are the attributes of a file?
e)	Name the registers used in I/O ports.
2.	**MCQ**
a)	Which one of the following contains information associated with a specific process? i) Job Queue ii) Buffer iii) Process Control Block iv) Memory
b)	_____is the time from the submission of a request until the first response is produced. i) Waiting time ii) Response Time iii) Turnaround time iv) Burst time
c)	One solution to the problem of external fragmentation is _____. i) Swapping ii) Compaction iii) First Fit iv) Best Fit
d)	When does page fault occur? i) The page is present in memory. ii) The deadlock occurs. iii) The page is not present in memory. iv) All the above
e)	The _____is the time for the disk arm to move the heads to the cylinder containing the desired sector. i) Rotational latency ii) Seek time iii) Bandwidth iv) Access time
	SECTION A - K2 (CO1)
	Answer ALL the Questions **(10 x 1 = 10)**
3.	**True or False**
a)	The long-term scheduler, selects from among the processes that are ready to execute and allocates the CPU to one of them.
b)	In preemptive scheduling, once the CPU has been allocated to a process, the process keeps the CPU until it releases the CPU either by terminating or by switching to the waiting state.
c)	Paging is a memory management scheme that permits the physical address space of a process to be noncontiguous.
d)	Virtual memory is commonly implemented by demand paging.
e)	In the FCFS disk scheduling, disk arm starts at one end of the disk and moves toward the other end, servicing requests as it reaches each cylinder, until it gets to the other end of the disk.
4.	**Fill in the blanks**
a)	_____ provides the interface between a process and operating system
b)	Banker's algorithm is used to handle deadlock _____
c)	An address generated by the CPU is commonly referred to as a _____.
d)	_____page replacement algorithm replaces the page that will not be used for the longest period of time.
e)	The disk _____is the total number of bytes transfered, divided by the total time between the first request for service and the completion of the last transfer.

SECTION B - K3 (CO2)	
	Answer any TWO of the following (2 x 10 = 20)
5.	Explain about the services provided by operating systems.
6.	Illustrate resource allocation graph and show how it is used to detect deadlock?
7.	Explain the steps for handling page fault with necessary diagram.
8.	Write short notes on I/O hardware.
SECTION C – K4 (CO3)	
	Answer any TWO of the following (2 x 10 = 20)
9.	Explain the two fundamental models of Inter Process Communication.
10.	Explain the methods used for dead lock prevention.
11.	Write short notes on the following a) Swapping b) Dynamic Loading c) Dynamic Linking
12.	Explain the structure of magnetic disk storage with Moving-head disk mechanism
SECTION D – K5 (CO4)	
	Answer any ONE of the following (1 x 20 = 20)
13.	Evaluate the average waiting time and turnaround time using FCFS, SJF, and RR (quantum = 10 milliseconds) scheduling algorithms for the following set of processes. All five processes arrive at time 0, in the order given, Process Burst Time --- --- P1 10 p2 29 P3 3 p4 7 P5 12 Which algorithm would give the minimum average waiting time?
14.	Briefly explain the paging and segmentation techniques with necessary diagrams
SECTION E – K6 (CO5)	
	Answer any ONE of the following (1 x 20 = 20)
15.	a) Explain about the different types of file access methods. (8 Marks) b) Solve the following page reference string 1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6. using frame size 3 to find the number of page faults using the following replacement algorithms : FIFO and LRU. (12 Marks)
16.	a) Write in brief about different file allocation methods. (10 Marks) b) Solve the following disk queue with requests for I/0 to blocks on cylinders in the order 98, 183, 37, 122, 14, 124, 65, 67. If the disk head is initially at cylinder 53, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests for each of the following disk-scheduling algorithms? i) FCFS ii) SSTF (10 Marks)

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