	QI.1.2. Choose only ONE answer. *
	A process is at priority 200 at a given point of time. What will be its priority after 10 minutes using an aging system in which the priority is incremented periodically every 5 seconds:
	O 190.
	○ Zero.
	O 80.
	None of the given options is correct.
QI.1.1. Choose only ONE answer. *	
An I/O-bound program typically has many short $__$ and a CPU-bound program might have a few long $__$.	QI.1.3. Choose only ONE answer. *
I/O burst, I/O burst.	Which of the following items does NOT belong to the function of a dispatcher?
// U/O burst, CPU burst.	Switching to user mode.
CPU burst, CPU burst.	Switching context from one process to another.
CPU burst, I/O burst.	O Jumping to the proper location in the user program to resume that program.
	Selecting a process among the available ones in the ready queue.
QI.1.4. Choose only ONE answer. *	
GI.1.4. CHOOSE ONLY ONE answer.	
Which of the following scheduling algorithms gives the minimum average response time?	
Multilevel queue.	
Shortest Job First.	
Round Robin.	
First-Come, First-Served.	
QI.1.5. Choose only ONE answer. *	
A significant problem with priority scheduling algorithms is $__$.	
O Determining the length of the next CPU burst.	
Starvation.	
Ocomplexity.	
O Determining the length of the time quantum.	
QI.1.5. Choose only ONE answer. *	
$\label{lem:algorithms} A \ significant \ problem \ with \ priority \ scheduling \ algorithms \ is \ __\$	
O Determining the length of the next CPU burst.	
Starvation.	
Complexity.	
O Determining the length of the time quantum.	
Other:	

Consider the following set of processes:

Process#	Arrival Time	Burst Time (ms)	Priority
A	0	5	4
В	6	2	2
C	3	3	1
D	2	5	2

: Lower number means higher priority

Suppose the following Gantt charts show the order in which processes are executed according to specific scheduling algorithm. Select the scheduling algorithms used with the provided Gantt chart:

A	Α	D	C	C	C	D	В	D	В	D	D	Λ	Α	Α
-	-	-	2		-								2 4	

Ql.1.6. Choose only ONE answer. *	Note: When a process finishes at the same time another process arrives, the new process will be submitted to the ready queue first.
If the time quantum gets too large, Round Robin scheduling degenerates (becomes similar)	(Non-preemptive) Shortest Job First.
to? Shortest Job First.	First-Come-First-Served.
	Round-Robin with time quantum 1ms.
Multilevel queue.	Preemptive priority/ Round-Robin with time quantum 1ms.
First-Come, First-Served.	(Preemptive) Shortest Remaining Time First.
Shortest-remaining-time-first.	Non-preemptive priority
	1 Northeembre bronts.

QI.2.2.*

 $Consider\ the\ following\ set\ of\ processes:$

Process#	Arrival Time	Burst Time (ms)	Priority	
A	0	5	4	
6		2	2	
C	3	3	1	
D	2	5	2	

*: Lower number means higher priority

Suppose the following Gantt charts show the order in which processes are executed according to specific scheduling algorithm. Select the scheduling algorithms used with the provided Gantt chart:

		Α.			D	D	D	D	D.	0	0	1/2	D	В
-			_	_	_	_								B 15

First-Come-First-Served.

O (Non-preemptive) Shortest Job First.

*: Lo																						
Suppo specif chart:	ic sc																					
		Α	A	1		Α	A	D		D	D	. 1	D	D	(C	1	-	В	В	
	0		1	2	3		4	5	6		7	8	9		10	11		12	13	1	4	15
Note:									sar	ne	time	an	oth	eri	proc	ess	arı	rive	s, tl	ne ne	w į	pn
Fir	st-C	om	e-F	irst-	Ser	rve	d.															
(N	on-p	ree	mp	tive	e) SI	hor	tes	t Jo	b F	irs	t.											
(Pi	eem	pti	ive)	She	orte	est	Rer	nain	ing	Т	ime	Fire	st.									
) Ro	und-	Ro	bin	wit	h ti	me	qu	antu	m	1m	ıs.											
) Pre	em	ptiv	/e p	rior	ity/	R	oun	d-Ro	bin	w	ith 1	ime	e q	uar	ntur	n 1	ms	s.				
) Ro	und-	Ro	bin	wit	h ti	me	qu	antu	m	3 r	ns.											
) No	n-pr	eer	mpt	ive	pric	orit	y.															

Process# A B	owing set of processes Arrival Time				
		Burst Time		rity	
C	6	5 2	4 2		
	3 2	3 5	1 2		
Lower number	er means higher priority			d according to	
pecific scheduli hart:	ng algorithm. Select t	he scheduling algorithm	s used with the p	rovided Gantt	
submitted to the (Preemptive) First-Come-F Round-Robin Non-preempt (Non-preempt Round-Robin	ready queue first.) Shortest Remaining First-Served. In with time quantum tive priority. prive) Shortest Job Form In with time quantum In with time quantum	3 ms. irst. 1 ms.		cess will be	
Preemptive p	riority/ Round-Robin	with time quantum 1r	ns.		
2.4. *					
onsider the following					
Process# A B	Arrival Time	Burst Time (ms)	Priority 4		
	6 3 2	3 5	1 2		
ific scheduling alg	Gantt charts show the ore gorithm. Select the sched D D C C 3 4 5 6 7 8	der in which processes are excluding algorithms used with C A A B B B D 9 10 11 12 13 14 nother process arrives, the ne	the provided Gantt		
nitted to the ready					
on-preemptive)	rtest Remaining Time Fi Shortest Job First.	rst.			
2.5.					
.2.5. * Consider the following	set of processes:				
onsider the following	Arrival Time	Burst Time (ms)	Priority		
nsider the following	Arrival Time 0 6	5 2	4 2		
nsider the following	Arrival Time 0 6 3	5	4		
Process# A B C: Lower number mea suppose the following cecific scheduling algarat: A A A A O O O O O O O O O	Arrival Time 0 1 3 2 2 2 3 4 5 6 7 6 6 7 6 6 6 7 6 6 6 7 6 6	5 2 3 5 ler in which processes are equing algorithms used with D D D D B B 9 10 11 12 13 another process arrives, the new process arrives, the new process arrives.	2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		
Lower number mea	Arrival Time	5 2 3 5 ler in which processes are equing algorithms used with D D D D B B 9 10 11 12 13 another process arrives, the new process arrives, the new process arrives.	2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		
Lower number mean spose the following office scheduling algorities that the following	Arrival Time 0 3 2 2 Santial Priority Gantt charts show the ore gorithm. Select the scheel A A C C C 7 finishes at the same time a queue first. Itest Remaining Time Fi	5 2 3 5 ler in which processes are equing algorithms used with D D D D B B 9 10 11 12 13 another process arrives, the new process arrives, the new process arrives.	2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		
Process# A B C: Lower number mea pippose the following O 1 2 o 1 2 o 1 2 o 1 2 o 1 2 o 1 2 o 1 2 o 1 3 o 1	Arrival Time 0 6 3 3 2 sis higher priority Gantt charts show the orgorithm. Select the sched A A A C C C 3 4 5 6 7 finishes at the same time a queue first. rtest Remaining Time Fi	5 2 3 5 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		
Process# A B C D T: Lower number mea uppose the following 0 1 2 lote: When a process fubmitted to the ready (Preemptive) Shor (Non-preemptive) Preemptive prio Round-Robin with	Arrival Time 0 1 2 2 2 2 3 4 5 6 7 Inisises at the same time a queue first. rtest Remaining Time Fi	5 2 3 5 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	(Non-	preemptive) Shortest Job First.
Process# A B C D T: Lower number meatuppose the following pecific scheduling algebration and process furbilities to the ready (Preemptive) Short (Non-preemptive) Non-preemptive Preemptive prio	Arrival Time 0 1 2 2 2 2 3 4 5 6 7 Inisises at the same time a queue first. rtest Remaining Time Fi	5 2 3 5 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	_	preemptive) Shortest Job First.
onsider the following Process# A	Arrival Time 0 1 3 3 3 3 3 3 3 4 5 6 7 Initialises at the same time a queue first. rtest Remaining Time First Shortest Job First. 2 3 4 5 6 7 Time First A A A A A B B B B B B B B B B B B B B	s 2 3 5 5 5 5 5 5 5 5 5	2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	○ Non-p	preemptive priority.
Process# A C C D T. Lower number mea suppose the following algorithm of the control of the	Arrival Time 0 3 2 2 2 3 2 3 2 3 4 5 6 7 Timishes at the same time a queue first. rtest Remaining Time First. Shortest Job First. c priority. rity/ Round-Robin with the time quantum 1 ms. the time quantum 3 ms.	5 2 3 5 5 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	○ Non-p	oreemptive priority. d-Robin with time quantum 3 ms.
process# Consider the following	Arrival Time 0	s 2 3 5 5 5 5 5 5 5 5 5	2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	○ Non-p	preemptive priority.
onsider the following Process#	Arrival Time 0	s 2 3 5 5 5 5 5 5 5 5 5	ecuted according to the provided Gantt B 14 15 w process will be Priority 4 2 2 1 2	Non-p	oreemptive priority. d-Robin with time quantum 3 ms.
insider the following frocess# Lower number mean process for the following algority of the following algorithm of the following algori	Arrival Time 0 3 2 2 3 2 3 2 3 3 4 5 6 7 Timishes at the same time a queue first. rtest Remaining Time First. Shortest Job First. 4 4 6 7 Timishes at the same time a queue first. rtest Remaining Time First. 4 6 7 Timishes at the same time a queue first. rtest Remaining Time First. 4 7 Timishes at the same time a queue first. 1 1 1 1 1 1 1 1 1 1 1 1 1	ier in which processes are equing algorithms used with the process arrives, the new process arrives, the new process arrives arrives, the new process arrives arrives.	2 1 2 2 secuted according to the provided Gantt B 14 15 w process will be Priority 4 2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Non-p Round Round First-	oreemptive priority. d-Robin with time quantum 3 ms. d-Robin with time quantum 1ms.
Lower number mean popose the following scheduling algorithms are scheduling algorithms and the scheduling algorithms are scheduling algorithms are scheduling algorithms. (Preemptive) Short (Non-preemptive) Preemptive prior Round-Robin will be removed by the removed by t	Arrival Time 0 1 3 2 2 3 2 2 3 3 2 3 3 2 3 4 5 6 7 7 8 8 8 9 9 10 10 10 10 10 10 10 10	s 2 3 5 5 5 5 5 5 5 5 5	Priority Pri	Non-p Round Round First-t Preen	oreemptive priority. d-Robin with time quantum 3 ms. d-Robin with time quantum 1 ms. Come-First-Served.

QII.1.1. Choose only ONE answer. *		
The contiguous memory allocation scheme with variable-partition sizes suffers from:		
External Fragmentation.		
Internal Fragmentation.		
O Decreasing the degree of multiprogramming.		
QII.1.2. Choose only ONE answer. *	QII.1.3. Choose only ONE answer. *	QII.1.4. Choose only ONE answer. *
If the base register is loaded with value 20345 and limit register is loaded with value 1000, which of the following memory address access will not result in a true to the operating system?	Shuffling memory contents to place all free memory together in one large block is called:	If the starting address location changes, in which of the following cases, the program must be recompiled?
O 20300	Address binding.	Execution time binding.
21345	Swapping.	O Load time binding.
O 21000	Compaction.	Compile time binding.
QII.1.5. Choose only ONE answer. *	DII.1.6. Choose only ONE answer. *	QII.1.7. Choose only ONE answer. *
An address generated by a CPU is referred to as a	Which of the following is true about dynamic storage allocation?	Consider a process with 10 pages. The page size is 256 bytes, and the variable S in this process has the logical address 2200. What is the logical address of S in the representation of (y,d) , where p is the page multier and is the page offset? Note The first page is Fage 0.
Physical address.	Worst fit provides the best storage utilization.	(8, 152)
Memory-Management Unit (MMU) generated address.	Best fit produces the largest leftover hole.	(8,59)
Logical address.	First fit requires less time for allocation than worst fit on average.	(10,152)

	QII.2.1*	QII.2.2*
QII.1.8. Choose only ONE answer. *	Consider a paging memory management scheme with the following characteristics: the logical address consists of 12 bits, the number of frames in the physical memory is 32 frames and the page size is 1 RU. Complete the following statements using the appropriate numbers from the provided choices:	Consider a paging memory management scheme with the following characteristics: the logical address consists of 12 bits, the number of frames in the physical memory is 32 frames and the page size 1 kB.
Given memory partitions of 120K, 100K, and 40K (in order) as follows:	Complete the following statements using the appropriate numbers from the provided choices.	Complete the following statements using the appropriate numbers from the provided choices:
120K 100K 40K	The size of the logical address space isbytes.	The logical address space can contain pages.
Three new processes arrived in order P1, P2, and P3 of sizes 40K, 110K, and 80K respectively, and are allocated the above memory partitions as shown below.	O 3072	● 4
	O 2*15	
	2*10	O 10
Indicate which dynamic allocation algorithm was used above:	O 2058	O 2
Best-fit.	O 2008	O 12
O First-fit.	O 12	O 3
O Worst-fit.	O 2°12	0.0

QII.2.3 *	
Consider a paging memory management scheme with the following characteristics: the logical address consists of 12 bits, the number of frames in the physical memory is 32 frames and the page size is 1 KB.	O 10
Complete the following statements using the appropriate numbers from the provided choices:	O 2*5
bits are required for the offset.	O 12
O 10	O 2*12
O 2°5	5
O 12	O 2*10
bits are required for the page number.	
bits are required for the page number.	
② ② ② ③ ② ③ ② ③ ③ ② ③ ③ ③ ③ ③ ③ ③ ③ ③ ③ ③ ③ ③ ③ ② ③ ③ ③ ③ ③ ③ ② ③ ③ ③ ② ③ ③ ③ ③ ③ ③ ③ ③ ③ ③ ② ③ ② ③ ④ ③ ④ ③ ④ ③ ④ ③ ④ ③ ④ ⑤ ④ ⑥ ④ ⑥ ④ ⑥ ⑤ ④ ⑥	
O 10	
O 12	
O 3	
O 4	
O 15	
QII.2.5 *	
Consider a paging memory management scheme with the following characteristics: the logical	

		Oll26*			
address consists of 12 bits, the number page size is 1 KB. Complete the following statements using	at scheme with the following characteristics: the log of transes in the physical memory is 32 transes and g the appropriate numbers from the provided choice address space isbytes.	address consists of 12 bits, page size is 1 KB. Complete the following stat	management scheme with the following characteristics: the legical manufacture of frames in the physical memory is 22 frames and the tenents using the appropriate numbers from the provided choices: al address that is corresponding to the following legical address; (#150) and the first of the frame #3 has been allocated for page (#150). Suppose that frame #3 has been allocated for page		
# 0 0 0 0		ldentify which pa	6 0 2 3 4 2 5 6 4 ge replacement algorithm is being utilized in the following chi 3 2 0 6 10 2 3 4 2 5 6 4 0 0 0 0 4 4 5 6 1 1 5 5 5 1 2 2 2 2 2 2 2 4	pages 0, 1, 2 and 3 these pages has be Page	d paging system in which main memory consists of 4 frames. Suppose are in memory at a given time. The number of times that each of on referenced is given below: Tambler Ta
Oill.1.3 * For each description in treplacement algorithms in First-in, first-out (Fi	IFO) b) Optimal (OPT) c) Leas	et recently used (LRU)	Gill.2.1. Choose the best answer to fill in the blanks.		
Suffers from Belady's anomaly Guarantees the	OPT	LRU O	Index [local, global] replacement, the set of programment of the paging behavior of that process but other processes. local global	ages in memory for a process also on the paging behavior of	
lowest possible page- fault rate for a fixed number of frames Associates with each page the time of that page's last use	o, •	•	QIII.2.2. Choose the best answer to fill in the blanks. A page fault means that we referenced a page not in	(main memory, secondary	GIII.2.3. Choose the best answer to fill in the blanks.* According to Biclay's anomaly, for some page replacement algorithms, the page fash rules are page fash rules
Difficult to implement because requires future knowledge of the reference string	· •	0	main memory secondary memory		increase decrease remain the same
GIII.2.4. Choose the best answer to for The	ill in the blanks, * t, limit register) tells the system whether a page	QIII.2.6. Choose the best		OM.2.7. Choose the best answ.	
				need to be split between the follow P_2 of size 200 KB.	rames where the frame size is 1KB. Suppose these frames ving two processes: process P_I of size 50 KB and a process

O 60

② 24○ 30

Suppose that a page is beavily used in the initial phases of a process but then is never used again. The page remains in memory even though it is no longer needed if the ______ (least frequently used (LFU), most frequently used (MFU)) page replacement algorithm is utilized.

least frequently used (LFU)
 most frequently used (MFU)

O 1300 ns

99.97 ns1299.97 ns