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Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FOURTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MAY 2019
Course Code: CS204
Course Name: OPERATING SYSTEMS (CS)

Max. Marks: 100   Duration: 3 Hours

PART A
Answer all questions. Each carries 3 marks.

1   What is the need for system calls in Operating System?   3

2   How does the hardware find the Operating System kernel after system switch-on?   3

3   The long term scheduler directly affectsthe system performance. Explain how.   3

4   Differentiate thread from a process.   3

PART B
Answer any two questions. Each carries 9 marks.

5   Explain the Kernel data structures with suitable example.   9

6   With the help of a diagram explain the different states of a process.   9

7   A writer process like to send some bulk information to a reader process. Explain the IPC mechanism that can be used for the purpose.   9

PART C
Answer all questions. Each carries 3 marks.

8   What is the difference between counting and binary semaphores?   3

9   Explain the syntax of a monitor.   3

10   What is preemptive scheduling? Give one disadvantage of preemptive scheduling.   3

11   What are the necessary conditions that cause deadlock in a system?   3

PART D
Answer any two questions. Each carries 9 marks.

12   Write an algorithm that satisfies all the critical-section requirements for n process.   9

13   Find the average waiting time and average turnaround time for the processes given in the table below using:- i) SRT scheduling algorithm ii) Priority scheduling algorithm   9

Process	Arrival Time (ms)	CPU Burst Time (ms)	Priority
P1	0	5	3
P2	2	4	1
P3	3	1	2
P4	5	2	4

14   Consider the following snapshot of a system with five processes P1, P2, P3, P4,   9
P5 and four resources A,B,C,D. Using Bankers Algorithm check whether the
system is in safe state or not.

	Allocation					Max					Available			
	A	B	C	D		A	B	C	D		A	B	C	D
P1	1	0	2	2		3	2	5	2		3	0	0	1
P2	0	2	1	2		3	4	1	2					
P3	2	4	5	0		2	7	7	3					
P4	3	0	0	0		5	5	0	7					
P5	4	2	1	3		6	2	1	4					

PART E

Answer any four questions. Each carries 10 marks.

15   a)   Differentiate logical address and physical address with an example.   4

     b)   What is dynamic storage-allocation problem with respect to contiguous memory   6
allocation? Discuss the three strategies that act as a common solution to this
problem.

16   a)   What is demand paging? What are its advantages?   4

     b)   Consider the reference string: 8 4 6 4 3 5 8 4 3 2 3 5 8. Assuming demand paging   6
with four frames, how many page faults would occur for:-

       i) FIFO replacement algorithm

       ii) Optimal replacement algorithm

17   a)   With the help of an example explain the paging concept.   6

     b)   Does paging suffer from fragmentation? Explain.   4

18   a)   Compare sequential access and direct access methods of storage devices.   4

     b)   What is the significance of access rights associated with each file in a system?   6

19   a)   How can we make a new magnetic disk ready for use (to store files)?   5

     b)   What is swap space? How is it managed in Linux system?   5

20   Explain FCFS, SSTF and SCAN disk scheduling algorithms, using thegiven disk   10
queue of requests: - 20, 89, 130, 45 and 180. Assume that, the disk has 200
platters ranging from 0 to 199 and the current position of head is at cylinder 100.