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, P5 and four resources A,B,C,D. Using Bankers Algorithm check whether the system is in safe state or not. 9

	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 allocation? Discuss the three strategies that act as a common solution to this problem. 6

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 with four frames, how many page faults would occur for:- 6

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 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. 10