Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FOURTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018
Course Code: CS204
Course Name: OPERATING SYSTEMS (CS)

Max. Marks: 100   Duration: 3 Hours

PART A
Answer all questions, each carries 3 marks

Marks

1	What is the purpose of interrupts? How does an interrupt differ from a trap?	(3)
2	Mention the advantages of using loadable kernel modules?	(3)
3	Why is context switching considered to be an overhead to the system?	(3)
4	How are named pipes different from ordinary pipes?	(3)

PART B
Answer any two questions, each carries 9 marks

5   a)   Describe the differences between symmetric and asymmetric multiprocessing. What are the advantages and disadvantages of multiprocessor systems?   (6)

     b)   What do you mean by peer to peer computing?   (3)

6   a)   What is a process? With the help of a diagram, explain the different process states.   (6)

     b)   What is cache coherency problem?   (3)

7   a)   Why does an Operating system require dual-mode and multi-mode operations?   (6)

     b)   How is IPC using shared memory done?   (3)

PART C
Answer all questions, each carries 3 marks

8	How can test and set instruction be used to ensure mutual exclusion?	(3)
9	How does the signal() operation associated with monitors differ from the corresponding operation defined for semaphores?	(3)
10	What are the functions of a dispatcher?	(3)
11	With the help of a diagram, explain how a multilevel feedback queue scheduling works?	

PART D
Answer any two questions, each carries 9 marks

12   a   Explain how semaphores can be used to solve Readers-Writers problem.   (6)

     b   Explain why implementing synchronization primitives by disabling interrupts is not appropriate in a single-processor system if the synchronization primitives are to be used in user-level programs.   (3)

13   a)   How can indefinite blocking can be solved in priority scheduling?   (3)

     b)   Assume you have the following jobs shown in the table to execute with one processor. Calculate the average waiting time and average turnaround time if the system uses RR Scheduling and the time slice is 4ms.   (6)

Process	Burst time(ms)	Arrival time
0	11	0
1	13	5
2	6	9
3	9	13
4	12	17

14   a)   What do you mean by deadlock? What are the four necessary conditions for a deadlock to occur?   (3)

     b)   Consider a system with four processes P1, P2, P3, P4, and four types of resources R1, R2, R3, R4. The maximum no: of instances of resources of each type are 5, 7, 7 and 7 respectively. What will be the order of processing of jobs if the allocated matrix and the maximum claim (that each process can claim) matrix are as given below.   (6)

	Allocated Matrix				Maximum Claim			
	R1	R2	R3	R4	R1	R2	R3	R4
P1	2	1	3	2	3	5	6	4
P2	0	0	1	2	1	3	4	6
P3	1	2	1	1	1	4	3	2
P4	1	1	0	2	2	3	1	2

PART E
Answer any four questions. Each carries 10 marks.

15   a)   With a diagram, explain how paging is done with TLB.   (6)

     b)   How is protection done in paging systems?   (4)

16   a)   Differentiate internal fragmentation and external fragmentation.   (4)

     b)   How is swapping done? Explain with the help of a diagram.   (6)

17   a)   What do you mean by thrashing? How is it caused?   (4)

     b)   Consider the following page reference string: (6)
         7,2,3,1,2,5,3,4,6,7,7,1,0,5,4,6,2,3,0,1.
         Assuming demand paging with three frames, how many page faults would occur for the following page replacement algorithms.
         i) LRU replacement   ii) FIFO replacement   iii) Optimal replacement

18   a)   The read write head is at 97. The head is moving from 299 to 0. Requests are in the order 94, 82, 101, 110, 198, 75, 87, 124, 136. How much time is required by the system if the system is following: (6)
         i) Shortest seek time first.   ii) C-Scan.
         iii) Elevator algorithm. Assume 1 head movement takes 1 ms.

     b)   How is disk formatting done?   (4)

19   a)   Explain sequential access and direct access methods   (5)

     b)   Explain indexed allocation method with an example diagram   (5)

20   a)   What is the use of access matrix in protection mechanism?   (6)

     b)   How are bad blocks in disks managed?   (4)

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