

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SIXTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MAY 2019

Course Code: EC366

Course Name: Real Time Operating Systems

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks

Marks

- 1 a) Describe the virtual machine structure of operating system design. (8)
- b) Compare FCFS and Round Robin Scheduling algorithms. (4)
- c) Discuss the problems associated with multiprocessor scheduling. How they can be solved? (3)
- 2 a) Describe the function of operating system as an abstract machine. (5)
- b) Schedule the given list of processes using SJF and Priority algorithms. Compare their performances. (10)

Process	Burst Time	Priority
P1	8	3
P2	5	1
P3	2	4
P4	4	2
P5	3	3

- 3 a) Explain the monolithic and layered architecture of operating systems. (12)
- b) Differentiate Pre-emptive and Non Pre-emptive Scheduling schemes. Give examples. (3)

PART B

Answer any two full questions, each carries 15 marks

- 4 a) Discuss the different methods of preventing deadlock. (8)
- b) Explain the basic concepts of demand paging. (7)
- 5 a) What is meant by critical section problem? Why it is atomic in nature? (5)
- b) Consider the following page-reference string: (10)

7, 0, 1, 2, 0, 3, 1, 6, 4, 0, 1, 0, 3, 1, 2, 1

Compute and compare the Page Fault Rate for the following replacement algorithms, assuming frame size to be 3. Also assume that the frames are initially empty.

- i) LRU replacement

ii) Optimal replacement

- 6 a) Give the structure of a page table entry used with virtual memory. (4)
b) State and explain the Dining Philosopher problem. Give a suitable solution(with code) to the problem using semaphore. (11)

PART C

Answer any two full questions, each carries 20 marks

- 7 a) Explain the various inter-process communication techniques supported by VxWorks and MicroC/OS. (12)
b) Explain the techniques for performing I/O functions (8)
- 8 a) Write in detail about any three disk scheduling algorithms. (12)
b) Explain how $\mu\text{C}/\text{OS}$ -II handles the critical section of code. (8)
- 9 a) Give a detailed description about the different I/O buffering schemes. (10)
b) Using a block diagram explain how a real time system is implemented. Describe a real life example of an RTOS control system. (10)
