

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**SIXTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018**

**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) What is the significance of a virtual computer? (2)  
 b) Compare Parallel Operating systems and Distributed operating systems. (5)  
 c) Explain Round Robin algorithm for scheduling. (8)

Draw the Gantt chart for the list of processes using round robin algorithm.

Assume time quantum=2 ms.

| Process | Burst Time (ms) |
|---------|-----------------|
| P1      | 10              |
| P2      | 5               |
| P3      | 2               |

- 2 a) List the functions of an operating system as resource manager. (2)  
 b) Differentiate Pre-emptive and Non Pre-emptive Scheduling schemes. (6)  
 c) Describe the criteria to be taken care of while designing a scheduling scheme. (7)
- 3 a) Describe the features of Multilevel feedback queue scheduling. (2)  
 b) Differentiate Kernel Mode and User mode of operations. (3)  
 c) Explain the monolithic and microkernel architectures of OS kernel. Which one is better? Give reasons. (10)

**PART B**

*Answer any two full questions, each carries 15 marks.*

- 4 a) Describe the principles of deadlock. (3)  
 b) Consider the following page-reference string: (12)

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

Compute and compare the Page Fault Rate for the following replacement algorithms, assuming frame size to be 4? Assume that the frames are initially empty.

- (i) FIFO replacement.
  - (ii) Optimal replacement.
- 5 a) Using a suitable example, illustrate dynamic partitioning. (5)
- b) With proper code write in detail about producer-consumer problem and suggest a suitable solution. (10)
- 6 a) Using suitable examples, illustrate the idea behind resource allocation graphs. (5)
- b) Explain the concept of Demand Paging. (5)
- c) State and explain the Dining Philosopher problem. Illustrate a solution using fork function. (5)

### PART C

*Answer any two full questions, each carries 20 marks.*

- 7 a) Explain the various I/O buffering schemes. (10)
- b) Write in detail about the evolution of I/O function. (10)
- 8 a) Prepare suitable requirements table for an RTOS control system used in adaptive cruise control. (10)
- b) Using a sample case study explain how real time system is implemented. Draw necessary diagrams to depict the hardware and software implementation. (10)
- 9 a) Explain the various disk scheduling techniques. (10)
- b) Compare the characteristics of Vxworks and  $\mu$ COS. (10)

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