

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

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

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
Sixth semester B.Tech degree examinations (S), September 2020

**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) Explain the different types of OS architectures in detail. (15)
- 2 a) Explain Priority scheduling algorithm. (6)
- b) Draw the Gantt chart for the list of processes given below using Priority scheduling. Also compute the wait time. Assume lower numbers have higher priority. (9)

Process	Burst Time (ms)	Priority
P1	12	2
P2	4	0
P3	6	3
P4	3	4
P5	5	1

- 3 a) Describe the evolution of OS. (8)
- b) Describe with a diagram the states that a process goes through. (7)

**PART B**

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

- 4 a) Explain the classical readers/writers problem with respect to synchronisation. (10)  
With pseudo code, explain a solution to this problem.
- b) Explain any two hardware techniques for mutual exclusion. (5)
- 5 a) What is deadlock? What are the strategies to deal with deadlock? (10)
- b) Discuss the fixed and dynamic memory partitioning techniques. (5)
- 6 a) Consider the following page-reference string: (9)

0, 2, 3, 1, 4, 1, 5, 3, 4, 1, 7

How many page faults would occur for the following replacement algorithms,

assuming frame size to be 3? Assume that the frames are initially empty

- i) LRU replacement
  - ii) FIFO replacement
  - iii) Optimal replacement
- b) Explain the following terms: (6)
- i) segmentation
  - ii) fragmentation

**PART C**

*Answer all questions, each carries 20 marks.*

- 7 a) What are the various I/O buffering schemes? Explain each. (10)
- b) Explain any three disk scheduling schemes. (10)
- 8 a) Explain the term disk cache and its need. (10)
- b) Design a RTOS control system for an avionics system. (10)
- 9 a) Describe the architecture of  $\mu$ COS. (10)
- b) Explain the interprocess communication techniques supported by VxWorks. (10)

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