**D**                                           **D7101**

Reg No.:_____                Name:_____

# APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017

**Course Code: IT305**
**Course Name: OPERATING SYSTEMS (IT)**

Max. Marks: 100                                           Duration: 3 Hours

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

| | | | |
|---|---|---|---|
| 1 | a) | Describe any one operating system structure in detail | (8) |
| | b) | What is the difference between pre-emptive and non pre-emptive scheduling algorithms? | (4) |
| | c) | What is dispatcher? | (3) |
| 2 | a) | What are the various states of a process? Explain with neat diagram. | (5) |
| | b) | What are real time systems? Give one example. | (5) |
| | c) | How is a system call implemented? | (5) |
| 3 | a) | What is Process Control Block? | (5) |
| | b) | Consider the following set of processes with | (10) |

CPU burst given in seconds

| Process | Arrival time | Burst time |
|---------|--------------|------------|
| P0 | 0 | 7 |
| P1 | 2 | 4 |
| P2 | 4 | 1 |
| P3 | 5 | 4 |

Assume quantum time for RR is 2

    (i)     Draw Gantt chart for FCFS, pre-emptive SJF and RR

    (ii)    What is the average turn around time for each of these scheduling algorithms?

    (iii)   What is the total waiting time for each of these scheduling algorithms?

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

| | | | |
|---|---|---|---|
| 4 | a) | Explain race condition with example. | (5) |
| | b) | What is thrashing? How is it handled? | (5) |
| | c) | What is demand paging? What are the advantages? | (5) |
| 5 | a) | What is Belady's anomaly? Illustrate with an example. | (5) |
| | b) | Consider the following page reference string: | (10) |

1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6

How many page faults would occur for the following replacement algorithms, assuming three frames? What happens when four frames are used?

All frames are initially empty, so your first pages will all cost one fault each

    (i)     LRU replacement.

(ii) FIFO replacement.

6  a)  What is the relevance of mutual exclusion to avoid race condition? Give one method to implement mutual exclusion.  (10)

  b)  How is a monitor superior to a semaphore?  (5)

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

7  a)  Give any four disk scheduling algorithms with examples.  (8)

  b)  Differentiate between single level directory structure and two-level directory structure.  (7)

  c)  Does a cycle in a resource allocation graph indicate a deadlock situation? Justify your answer.  (5)

8  a)  What is deadlock? What are the necessary conditions for a deadlock to occur?  (8)

  b)  How is linux file system implemented?  (7)

  c)  Explain the linear list implementation of directory  (5)

9  a)  Give the Banker's algorithm for deadlock avoidance. Analyse its efficiency.  (12)

  b)  What are the different access methods of files? How are they implemented?  (8)

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