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## P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

**Seventh Semester, B.E. - Electronics and Communication Engineering**

**Semester End Examination; Dec - 2016/Jan - 2017**

**Operating Systems**

*Time: 3 hrs*

*Max. Marks: 100*

*Note: Answer FIVE full questions, selecting ONE full question from each unit.*

### UNIT - I

- 1 a. Outline the services provided by the Operating System. 7
- b. Explain the simple batch system from two points of view: that of the monitor and that of the processor. Also draw the layout of the resident monitor. 7
- c. Analyze a simplified PCB by explaining its elements. 6
- 2 a. Explain the two state process model. 7
- b. Illustrate the distinction between threads and processes from the point of view of process management. 7
- c. Explain the four basic thread operations associated with a change in thread state. 6

### UNIT - II

- 3 a. When does race condition occur? Illustrate with examples. 7
- b. What are the requirements for Mutual Exclusion? 7
- c. Explain the synchronization protocol of classical Readers / Writers problem. 6
- 4 a. Differentiate between deadlock and starvation. How can deadlocks be prevented? Describe them. 7
- b. A safe state is not a deadlock state but a deadlock state is an unsafe state. Explain. 7
- c. Explain how "Dining Philosopher Problem" brings out the need for synchronization and avoids deadlocks. 6

### UNIT - III

- 5 a. What are the requirements of memory management? Explain any two of them. 7
- b. Illustrate the three placement algorithms with an example. Best-fit, First-fit, and Next-fit. 7
- c. Draw the tree representation of Buddy System and explain. 6
- 6 a. Illustrate the typical memory management formats. 7
- b. Explain the operation of a Translation Look-aside Buffer (TLB). 7
- c. What are the advantages of segmented address space over non-segmented address space? 6

**UNIT - IV**

- 7 a. Explain the DMA technique with a block diagram. 7
- b. Give the expansion of the following disk scheduling policies and explain them; 7
- i) FIFO           ii) SSTF.
- c. Explain the concept of RAID and list the three common characteristics shared by all the levels. 6
- 8 a. Explain the terms : 7
- i) Field           ii) Record
- iii) File          iv) Database with respect to the file structure.
- b. State the objectives of a file management system. 7
- c. Illustrate the following record blocking methods : 6
- i) Fixed blocking
- ii) Variable length spanned blocking.

**UNIT - V**

- 9 a. Explain the CIA triad with respect to computer security. 7
- b. List any six examples of intrusion. 7
- c. Define a virus. Classify the virus based on the type of target the virus tries to infect. 6
- 10 a. What is biometric authentication? Explain any two most commonly used physical characteristics in biometrics. 7
- b. What is an audit record? What are the fields that an audit record must contain? 7
- c. Analyze the concept of digital immune system with a diagram. 6

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