



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

*(An Autonomous Institution affiliated to VTU, Belgaum)*

**Fifth Semester, B.E. - Computer Science and Engineering**

**Semester End Examination ; Dec. - 2014**

**Operating System**

*Time: 3 hrs*

*Max. Marks: 100*

**Note:** i) Answer any **FIVE** full questions, selecting at least **TWO** full questions from each part.  
ii) Assume suitable missing data if any.

**PART - A**

- 1. a. Explain the following terms:
  - (i) Bootstrap Program                      (ii) Caching                                      (iii) trap    10
  - iv) Job pool                                      v) Symmetric multiprocessing.    10
- b. List operating system operation and its importance of transition.    10
- 2 a. What is a system call? Explain with an example.    5
- b. What are system program and write its importance?    5
- c. Differentiate between CPU- scheduler and Dispatcher. Explain the criteria for comparing CPU scheduling algorithms.    10
- 3 a. Explain the following with neat diagrams:    10
  - i) use threads ii) Kernel level threads
- b. Consider the following set of processes with arrival time.

Process	Burst Time	Arrival Time
P <sub>1</sub>	10	0
P <sub>2</sub>	1	0
P <sub>3</sub>	2	1
P <sub>4</sub>	4	2
P <sub>5</sub>	3	2

- i) Draw the Gantt chart using FCFS, SJF preemptive and Non- preemptive scheduling.    8
- ii) Calculate the waiting and average waiting for each of the scheduling algorithm.
- c. Write the differences between multi level queue scheduling and multi level feedback queue scheduling.    2
- 4 a. Explain Dining-philosophers problem using monitors.    10
- b. What is race condition? Explain readers writers problems with semaphore.    10

**PART - B**

5 a. For the following snapshot find the safe sequence using bankers algorithm. The number of resource units are R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> which are 7, 7, 10 respectively.

Process	Allocated Resources			Max. requirements		
	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>
P <sub>1</sub>	2	2	3	3	6	8
P <sub>2</sub>	2	0	3	4	3	3
P <sub>3</sub>	1	2	4	3	4	4

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b. Explain different methods to recover from deadlock. 6

c. Deadlock exists if a cycle exists. Yes or No. Justify the answer with an example. 8

6 a. Why are translation look-aside buffers (TLB) important? In a Simple paging system, what information is stored in TLB? Explain. 8

b. Given the memory partition of 100 K, 500K, 200K, 300K and 600K apply first fit and best fit algorithm to place 212K, 417K, 112K and 426K. 4

c. What is Swapping? Does this increase the operating system overhead? Justify your answer. 8

7 a. What are the functions performed by the virtual memory manager? Explain. 8

b. For the following page reference string calculate the number of page faults with FIFO and LRU page replacement policies when i) no. of page frames are three  
ii) Number of page frames are four. 12

Page reference string : 5 4 3 2 1 4 3 5 4 3 2 1 5

8 a. What is a file? Explain the different allocation methods. 10

b. Suppose the position of cylinder is at 53. Sketch the graphical representation for the queue of pending requests in the order 10

98, 183, 37, 122, 14, 124, 65, 67 for FCFS, SSTF and LOOK scheduling scheme.

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