



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

(An Autonomous Institution affiliated to VTU, Belgaum)

Seventh Semester, B.E. - Computer Science and Engineering

Semester End Examination; Dec - 2016/Jan - 2017

Multicore Architecture and Parallel Programming

Time: 3 hrs

Max. Marks: 100

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

UNIT - I

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| 1 a. | Explain the Flynn's taxonomy with the help of a suitable diagram. | 10 |
| | b. Program execution time is made up of 75% CPU time and 25% I/O time. Which is the better enhancement; | 6 |
| | i) Increasing the CPU speed by 50% ii) Reducing I/O time by half | |
| | c. Distinguish between concurrency and parallelism. | 4 |
| 2 a. | Enlist the different items need to understand of threading for user application. | 4 |
| | b. Discuss with a neat diagram, the flow of threads in an execution environment. | 8 |
| | c. What is virtualization? Describe Run time and System virtualization with a neat diagram. | 8 |

UNIT - II

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| 3 a. | State the challenges faced managing multiple threads and their communication. | 4 |
| | b. Write a C language implementation of the error diffusion algorithm. | 10 |
| | c. Name the benefits and risks of using threads in parallel programming. | 6 |
| 4 a. | Explain flow control-based concepts in parallel computing. | 8 |
| | b. Describe the use of a condition variable for the producer consumer problem. | 8 |
| | c. Write the various lock types. | 4 |

UNIT - III

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| 5 a. | With a program in C# language, illustrate a simple creation of a thread in the Microsoft .NET framework. | 10 |
| | b. Giving the prototypes of each, describe the following Pthread APIS: Pthread-create(), Pthread-detach(), Pthread-join(). | 10 |
| 6 a. | Explain the concept of thread pool with an example in .NET. | 10 |
| | b. Describe user-level threading package offered by windows called fibers. | 10 |

UNIT - IV

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| 7 a. | State the factors that threaded application performance with open MP is largely depended upon. | 7 |
| | b. In open MP, what are the different ways the memory can be declared as private? | 6 |
| | c. With a neat diagram, describe task queuing execution model. | 7 |

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| 8 a. | Discuss the reduction operators and variables initial value in open MP. | 8 |
| b. | Describe the four heavily used open MP library functions. | 8 |
| c. | List the four schedule schemes in open MP. | 4 |

UNIT - V

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| 9 a. | Explain briefly data organization for high performance. | 8 |
| b. | With a neat diagram, describe Itanium architecture. | 6 |
| c. | How do you conserve memory bandwidth and avoiding memory contention in multicore processors? | 6 |
| 10 a. | Describe Hash table with Fine-grained locking with a neat diagram. List the advantage and disadvantages of the technique. | 10 |
| b. | Explain why too many threads can seriously degrade program performance? | 10 |

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