U.S.N | | | | | | | | | | |

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

(An Autonomous Institution affiliated to VTU, Belagavi)

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

Semester End Examination; Jan. / Feb. - 2021

Multi-Core Architecture and Parallel Programming

Time: 3 hrs *Max. Marks: 100*

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

UNIT - I

1 a.	Explain Amdahl's law applied to HT technology.	7
b.	Write a note on Gustafson's law.	5
c.	Discuss with a neat figure the flow of threads in an execution environment.	8
2 a.	List the four types of problems to be addressed when multithreading is used in programs.	4
b.	Distinguish between runtime virtualization and system virtualization.	8
c.	Briefly describe about ILP.	8

UNIT - II

3 a.	Discuss the basic working steps of Floyd and Steinberg's algorithm and give the C-language implementation.	8
b.	Describe the different types of synchronization primitives.	12
4 a.	What is a condition variable? Briefly describe the use of a condition variable for the producer-consumer problem.	8
b.	Discuss the various lock types.	5
c.	Explain message passing model.	7

UNIT - III

5 a.	What is pthread? Explain with an example, how to create and use threads with pthreads?	10
b.	With C / C# code, describe briefly waking two threads through a broadcast to condition variables in pthreads.	10
6 a.	With a program in C# language, illustrate a simple creation of a thread in the Microsoft .NET framework.	8
b.	Explain user level threading package offered by windows called fibers.	12

UNIT - IV

7 a.	State the ways in which memory can be declared as private in OpenMP. Give examples.	10
b.	Write a short notes on the following: i) Interleaving single thread and multithread execution ii) Protecting updates of shared variables	10

Contd…2

8 a.	Explain the task queuing executing model.	8
b.	List the factors that threaded application performance with OpenMP is largely depended upon.	4
c.	Describe the four most heavily used OpenMP library functions.	8

UNIT - V

9 a.	Explain the different features of message passing interface.	6
b.	Describe briefly about topologies and embedding.	8
c.	Explain the six golden MPI functions.	6
10 a.	Write a note on blocking Non-Buffered communication.	8
b.	Enlist the different MPI data types.	4
c.	Describe briefly about overlapping communication with computation.	8

* * *