17/4/17 — FN

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 71694

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Eighth Semester

Computer Science and Engineering

CS 6801 — MULTI-CORE ARCHITECTURES AND PROGRAMMING

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Vector instructions.

2. What do you snooping cache coherence?

3. What is data sharing?

4. Difference between deadlocks and livelocks.

5. Write a "hello,world" program that uses OpenMP.

6. Define Odd-even transposition sort.

7. What is a wrapper script?

8. What are the possibilities for choosing a destination when sending requests for work with MPI?

9. Define NP-complete problem.

10. Write a Pseudocode for a recursive solution to TSP using depth-first search.

PART B — (5 × 16 = 80 marks)

11. (a) Explain in detail about interconnection networks.

Or

(b) (i) Write a short notes about MIMD system. (8)

(ii) Explain parallel program design with an example. (8)

12. (a) Explain the data races and scalability in parallel program.

Or

(b) Explain in detail about the synchronization primitives in parallel program challenges.

13. (a) Explain OpenMP directives.

Or

(b) How data and functional parallelism are handled in shared memory programming with openMP?

14. (a) (i) Explain tree structured communication. (8)

(ii) What are the differences between point to point and collective communication? (8)

Or

(b) (i) Explain the performance evaluation of MPI programs. (8)

(ii) What are the performance issues in multi core processors? (8)

15. (a) (i) How to parallelize the basic solver using MPI? (8)

(ii) Explain Non-recursive depth-first search. (8)

Or

(b) Explain the implementation of tree search Using MPI and dynamic partitioning.

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Reg. No. :

Question Paper Code : 40921

23/04/2018 FN

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018
Eighth Semester
Computer Science and Engineering
CS 6801 – MULTI-CORE ARCHITECTURES AND PROGRAMMING
(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A (10×2=20 Marks)

1. Define the symmetric shared memory.
2. List the pros and cons of distributed memory.
3. Write down the performance metrics.
4. Define mutex lock and spin lock.
5. Explain scope of a variable.
6. Define Race Condition.
7. Give the commands for MPI.
8. Define Broadcast and butterfly MPI.
9. How to compute n-body forces ?
10. List the data structures used for the serial implementations.

PART – B (5×16=80 Marks)

11. a) i) State and explain Amdahl's law in detail. (8)
    ii) Outline the steps in Designing and Building Parallel Programs. Give example. (8)

(OR)

b) Elaborate the classification of computer architecture used in parallel computing system.

12. a) i) Discuss in detail about producer-consumer synchronization. **(8)**

ii) Write a simple semaphore to sent a message. **(8)**

(OR)

b) i) List out the approaches and tools for detecting data races. **(8)**

ii) Write a short notes on deadlocks, livelocks and named pipes. **(8)**

13. a) Elaborate OpenMP execution model and memory model in detail.

(OR)

b) Write an example program for shared memory programming with pthread.

14. a) i) Explain loop handling in detail. **(8)**

ii) Describe about MPI Program execution with example. **(8)**

(OR)

b) Explain the Virtual memory in detail.

15. a) i) Describe collective vs. point to point communication. **(8)**

ii) Describe the Parallelizing the tree-search program using OpenMP. **(8)**

(OR)

b) Explain about tree search with Pseudo-code for a recursive solution to TSP using depth-first search.

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 52878

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Eighth/Seventh Semester

Computer Science and Engineering

CS 6801 — MULTI-CORE ARCHITECTURES AND PROGRAMMING

(Regulation 2013)

(Common to: PTCS 6801 – Multi-Core Architectures and Programming for B.E. (Part – Time) for seventh semester – Computer Science and Engineering – Regulation 2014)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the purpose of multi-core integrated circuits?
2. List of problems considering the increases in performance of multi core architectures.
3. How to avoid data races?
4. Define Critical Region.
5. What is the extension to distributed memory?
6. Define Von Neumann Architecture.
7. How OpenMP programs are compiled and executed?
8. What does the distributed memory consist of in MIMD?
9. Give the List of MPI Functions.
10. Define MPI Derived Data Types.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss in detail about the Interconnection networks.

Or

(b) Discuss in detail about the single and multi core architectures.

12. (a) Explain the Code for shared memory using Pthreads.

Or

(b) Explain the Code of message passing systems using MPI.

13. (a) Explain the Issues in Shared Memory Systems.

Or

(b) Explain in detail about the pseudocode for recursive solution and non recursive solution to TSP using depth first search.

14. (a) How can we decide which API, MPI, Pthreads, or OpenMP is best for our application?

Or

(b) Differentiate Collective and Point-to-Point Communication and Draw the architecture for tree structured Communication.

15. (a) Explain in detail about Patterns for parallel programming and OPL.

Or

(b) Explain in detail about the Challenges to Parallel Programming.

PART C — (1 × 15 = 15 marks)

16. (a) Explain with program for point-to-point communication and collective communication.

Or

(b) Write the tree search program both in OpenMp and MPI.

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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 50403

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017
Eighth Semester
Computer Science and Engineering
CS 6801 – MULTI-CORE ARCHITECTURES AND PROGRAMMING
(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A (10×2=20 Marks)

1. Differentiate symmetric memory architecture and distributed memory architecture.
2. What are multiprocessor systems and give their advantages.
3. What are conditions under which a deadlock situation may arise ?
4. Define thread. Mention the use of swapping.
5. Define message queue.
6. What is termed as initial task region ?
7. List the restrictions to work sharing constructs.
8. Write the performance evaluation methods is distributed memory programming.
9. What is race condition ?
10. What are the features of distributed memory ?

PART – B (5×16=80 Marks)

11. a) Explain in detail , the SIMD and MIMD systems. Discuss briefly the performance issues of multi-core processors.

(OR)

b) Define Cache Coherence Problem. What are the 2 main approaches to cache coherence ? Describe working of snooping cache coherence and explain describe directory based coherence.

12. a) Explain the various approaches to Parallel Programming.

(OR)

b) What is a data race ? What are the tools used for detecting data races ? How to avoid data races ?

13. a) Illustrate an OpenMP execution model with an example.

(OR)

b) Explain in detail about the handling loops in parallel operations.

14. a) What is MPI ? Write a program "hello, world" that makes some use of MPI. How to compile and execute MPI programs ?

(OR)

b) Differentiate collective and point-to-point communication and draw the architecture for tree structured communication.

15. a) What does the n-body problem do ? Give the pseudocode for serial n-body solver and for computing n-body forces.

(OR)

b) How will you parallelize the reduced solver using OpenMP ? How will you parallelize the reduced solver using OpenMP ?

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Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 20379

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Eighth Semester

Computer Science and Engineering

CS 6801 – MULTI-CORE ARCHITECTURES AND PROGRAMMING

(Regulations 2013)

(Common to PTCS 6801 – Multi-Core Architectures and Programming for B.E. (Part-Time) – Computer Science and Engineering – Regulations 2014)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State Amdahl's law.
2. What is symmetric shared memory?
3. List down the various synchronization primitives in parallel programming.
4. Compare deadlock and livelock in terms of resource reservation.
5. State the trapezoidal rule in OpenMP.
6. What are loop-carried dependencies?
7. Write a note on distributed memory machines.
8. How to compile an MPI program?
9. Name any two OpenMP environment variables.
10. List any two data scoping clauses in OpenMP.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Outline the distributed shared-memory architecture with a diagram. (8)

(ii) Present an outline of parallel program design. (8)

Or

(b) Highlight the limitations of single core processors and outline how multicore architectures overcome these limitations. (16)

12. (a) What is deadlock? Explain the four conditions for deadlock and present an example for deadlock in a parallel computing environment. (16)

Or

(b) (i) Outline the critical section problem with an example. (6)

(ii) Explain how semaphores can be used to accomplish mutual exclusion of parallel-process synchronization with an example. (10)

13. (a) (i) Outline the OpenMp execution model. (8)

(ii) Discuss about OpenMp directives with relevant examples. (8)

Or

(b) (i) What is loop-carried dependence? Explain with an example. (8)

(ii) Outline with an example the use of the greatest common divisor test to determine whether dependences exist in a loop. (8)

14. (a) Explain the structure of an MPI program with an example. (16)

Or

(b) (i) Outline collective vs point-to-point communications in MPI with an example. (8)

(ii) What is a MPI derived data type? How to create a MPI derived data type? Give any two examples. (8)

15. (a) Outline the process of parallelizing depth-first search algorithm using OpenMP with an example. (16)

Or

(b) Write a note on thread paradigm and compare OpenMP and MPI programming models. (16)

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 91413

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

Eighth/Seventh Semester

(Common to : Computer Science and Engineering)

CS 6801 – MULTI - CORE ARCHITECTURES AND PROGRAMMING

(Regulations – 2013)

(Also common to PTCS 6801 – Multi-core Architectures and Programming for B.E. Part – Time – Seventh Semester – Computer Science and Engineering – Regulations 2014)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. Define speed up and efficiency.
2. What is directory-based cache coherence ?
3. Draw the block diagram of distributed memory system and shared memory system.
4. Explain scope of variable.
5. What is named pipes ?
6. Define loop carried dependency with an example.
7. Write a Pseudocode for the MPI implementation of the reduced n-body solver.
8. What is NP - complete problem ?
9. Differentiate collective vs. point-to-point communications.
10. Write the Pseudocode for a recursive solution to TSP using depth-first search.

PART – B **(5×13=65 Marks)**

11. a) Explain shared and distributed memory interconnects.

(OR)

b) Explain in detail about Cache coherence.

12. a) Describe Synchronization primitive in detail.

(OR)

b) Describe the Communication between Threads and Processes.

13. a) Explain about scheduling loops.

(OR)

b) Describe the parallel for DIRECTIVE in detail.

14. a) Elaborate on the performance evaluation of MPI programs.

(OR)

b) Describe the COLLECTIVE COMMUNICATION in detail.

15. a) Explain the parallelizing the basic solver using OpenMP ? How do you evaluate OpenMP code ?

(OR)

b) Explain about the implementation of tree search using MPI and static partitioning.

PART – C **(1×15=15 Marks)**

16. a) Develop a MPI based program for implementing serial matrix-vector multiplication.

(OR)

b) Summarize the challenges of parallel programming and discuss about its impact on performance.