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B.E / B.Tech (FT ~~XXXX~~) END SEMESTER EXAMINATIONS – APRIL / MAY 2019

COMPUTER SCIENCE AND ENGINEERING

Semester VII

CS8702 – PARALLEL PROGRAMMING

(Regulation 2012)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Why do we need parallel computing?
2. Compare Task Level and Data Level Parallelism.
3. Explain false sharing with an example code?
4. What are the steps used in parallelizing the sequential program?
5. What is the need of Virtual memory in hardware parallelism?
6. State the reason why while loop and do while loop cannot be parallelized using openMP?
7. Write the program structure of MPI programming model?
8. Write the syntax for send and recv operation with example.
9. Compare the different types of data distribution available in MPI. Justify which is best.
10. Choose an application of your own choice where parallelism can be applied. Justify your answer.



Part – B (5 x 16 = 80 marks)

(Question No.11 is Compulsory)

11. Explain in brief about Shared Memory Programming and Message Passing Paradigm. (16)
12. a) Explain how cache coherence issues are resolved in parallel processors. (16)
(OR)
b) Briefly discuss the synchronization issues in parallel programming. (16)
13. a) Write an OpenMP program to simulate the management of a bank account, with the balance represented by a single shared variable. The program has two threads. Each thread shows the balance to the user and prompts for a debit (decrease) or a deposit (increase). Each thread then updates the balance in a critical section and displays the final balance to the user. (16)
(OR)
b) Discuss the OpenMP directives to compute matrix multiplication of two arrays $m \times n$ and explain the program flow. (16)

14. a) Explain briefly about the global operations in MPI. (16)
(OR)
b) Explain about asynchronous Communication and Collective Communication (16)
15. a) i) Explain in detail about the GPU Architecture with neat sketch. (8)
ii) Write the program to find the matrix addition of two $m \times n$ matrix using MPI. (8)
(OR)
b) Discuss CUDA memory types in detail. (16)

