

ME (CMPN) Sem II (B) 17/5/17

Sub: High Performance Computing

(3 Hours)

Q.P. Code: 013969

[Total Marks: 80]

- N.B. : 1) Q.1 is Compulsory
2) Solve any 3 out of remaining 5

- Q.1.a Explain the various criteria for classification of parallel computer. Explain Flynn's classification in detail. 10 M
- b What is the significance of
1. Bisection bandwidth 2. Network Diameter 5 M
- c Explain granularity of a parallel system. 5M
- Q.2.a Write a MPI program that prints out a "Hello World" Message from each processor 10 M
- b. What are principles of Message Passing Programming? 10 M
- Q.3.a Explain about process synchronization mechanism with Semaphore. 10 M
- b. Short note on 'SIMD matrix multiplication'. 10 M
- Q.4.a State Amdahl's law? 10 M
Suppose we are trying to determine whether it is worthwhile to develop a parallel version of a program solving a particular problem. Benchmarking reveals that 90 percent of the execution time is spent inside functions that we believe we can execute in parallel. The remaining 10 percent of the execution time is spent in functions that must be executed on a single processor. What is the maximum speedup that we could expect from a parallel version of the program executing on eight processors.
- b. Explain the various levels of parallel processing. 10 M
- Q.5.a Explain in brief Nanotechnology and its impact on high performance computing. 10 M
- b Explain Speedup, efficiency and scalability with suitable Example. 10 M
- Q.6. a Write a note on NVIDIA Tesla GPU. 5M
- b Differentiate a dataflow computer from a control flow computer. 5M
- c What is data Race? 5M
- d What is meant by grain packing and scheduling in parallel Processing. 5M