Sample Assessment

1. What are different types of Parallel Computer Memory Architectures?
2. Describe MPI API?
3. What are the advantages and disadvantages of using MPI?
4. Name some Minimal Set of MPI Routines.
5. What is the programming model of MPI?
6. Explain communicators, broadcasting, reduction in MPI.
7. Describe Non-Blocking Communication.
8. What is the main difference between point-to-point communication and collective communication in MPI?
9. Why use MPI collective communication routines, instead of having programmers implement a tree/butterfly structure of their own for their applications?
10. Which process(s) in the MPI communicator calls the MPI collective communication routines, especially when data exchange is required?
11. Describe a scenario where an MPI application can make use of both point-to-point communication as well as collective communication routines?
12. What is the difference between CPU time and Wall clock time, and when would you use one over the other for measuring application's performance?
13. When measuring performance of a multi-process application, how would you measure overall performance, or which process performance matters more than other for overall performance of the application.
14. What is the rank of an MPI process?
15. Compile Sample code using:

    mpicc -o programName sourceCode.c

    Run: on Workload manager and scheduler:
       % qsub programName
    Analyze and debug a code depending of the error and output files obtained
    If there is any error, location the error and fix it.
    Modify, Rescale, sample code
16. Provide examples of real life scientific applications that could be used for strong scaling vs weak scaling. Implement the distributed memory concept of MPI for calculating the area under the curve.
    How the scaling of the above program compares to the single core.