Question bank for HPC

1. What is the difference between parallelism and concurrency?
2. What is Flynn's taxonomy?
3. What is moore's law?
4. What is pipelining? Give example.
5. Compare Implicit and Explicit Parallelism
6. Explain different software Parallelism.
7. Explain the following architectures:
    a. Multi-core
    b. Multi-threaded
    c. N-Wide Superscalar
8. Explain the terms: critical path, degree of concurrency, Average degree of concurrency
9. Explain: Granularity, also explain Fine Granularity and Coarse Granularity
10. What is task dependency graph? Explain with the example.
11. Which are the basic principles of MPI?
12. Explain send and receive methods of MPI with example.
13. Which are the different functions of MPI? List and explain.
14. Write a CUDA program to add two numbers.
15. Write a CUDA code to add two arrays.
16. Explain: Instruction level, task level, transaction level, thread level parallelism.
17. Explain: VLIW Architecture.
18. How to find the minimum out of given numbers using recursion?
19. Explain characteristics of task.
20. Explain characteristics of interaction.
21. Explain the types of mapping techniques.
22. Which are the major communication overheads?
23. How to perform better load balancing?
24. Explain the difference between iterative and recursive way of finding the solution to a problem.
25. Explain divide and conquer strategy through Quick Sort algorithm example.
26. What is a profilers? List well known profilers available in the market.
27. Explain: gprof working in Linux.
28. List and explain 10 linux commands with examples.
29. Explain the steps of CUDA Program execution in Google Colab.
30. Explain the steps of C program execution using gcc compiler.