**Question Bank**

**MODULE 1**

1. Define parallelism and high performance computing.
2. Define uniprocessor system, multiprocessing system and parallel processing system.
3. Explain the concept of multiprogramming and time sharing system.
4. Explain different techniques developed in uniprocessor systems to achieve parallelism.
5. How to evaluate the performance of High performance computers?
6. Explain the different programmatic levels of parallel processing.
7. What is spatial parallelism?
8. State Feng’s scheme of parallel processing.
9. Explain Flynn’s classification of parallel processing system with neat diagrams.
10. Explain the significance of Feng’s classification of computers.
11. Explain the Indian contribution to parallel processing.
12. Explain the three architectural classification schemes briefly.

**Module 2**

# What are the classification of pipeline processors?

# Short note on ‘General Pipeline’.

# What is dynamic pipelining.Give one example.

# Define vectorizing compiler and vectorization.

# What is instruction pre-fetch and branch handling.

# Explain with example, how PREFETCH and BRANCH are handled.

# Explain the classification of pipeline processors in detail.

# Explain the design of pipelined instruction unit.

# Explain the principles of pipelining.

# Explain the design of Arithmetic pipeline unit.

# Design a floating point adder with four processing stages.

# Write on different parallel processing applications in various fields.

# Draw the diagram of a pipelined multiplier using CSA tree and explain its working.

# What is internal forwarding and register tagging?

# Explain the three classes of data dependent hazards. How the hazards can be avoided ?

# Explain vector processing.

# Define vectorizing compiler and vectorization.

**Module 3**

1. How to characterize a SIMD computer?
2. List the differences between static and dynamic networks.
3. Explain mesh connected network in detail.
4. Explain SIMD array processor in detail.
5. Explain associative array processing in detail.
6. What are interconnection networks?
7. Explain with figure on omega network.
8. Explain the features of various associative memory organizations.
9. Explain masking and data routing mechanisms.
10. What is multicache problem? Explain different methods to solve cache coherence.
11. Explain with figures mesh connected networks with its routing functions
12. Explain routing functions of Barrel shifters.
13. Explain SIMD array processors in detail.
14. Discuss the various aspects of Matrix multiplication algorithm for SIMD
15. Write notes on
16. SIMD matrix multiplication.
17. Parallel sorting on array processors.

**Module 4**

1. What are loosely coupled and tightly coupled multiprocessors ?
2. Explain the working of loosely coupled multiprocessor systems, with the help of a diagram.
3. Explain the working of a hierarchically structured multiprocessor.
4. Explain various process synchronization methods.
5. How parallelism in programs are detected ?
6. Explain all process synchronization mechanisms.
7. Discuss the characteristic features of parallel languages..
8. What are the various bus arbitration algorithms employed to control access to time shared bus ?
9. What are the usual assumptions made regarding critical regions?
10. Explain inter process communication mechanisms and read prevention methods.

**Module 5**

1. Differentiate dataflow and control flow computers.
2. What is a token store machine?
3. Explain the advantages and disadvantages of data flow computers.
4. Explain the working of Irvine data flow computers.
5. How does data flow graph helps in the design of data flow computers?
6. How the data flow computers differ from conventional computers?
7. Explain different data flow architecture.
8. Write short note on design alternatives to data flow approach.
9. Discuss the advantages of any two data driven languages
10. Explain Dennis Machine
11. Explain Arvind machine
12. Differentiate between static and dynamic data flow computers