BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)
B. Tech. Sem - VII Computer Science & Engineering AI & ML : WINTER : 2024
SUBJECT: HIGH PERFORMANCE PARALLEL COMPUTING

Day : Tuesday
Date : 03/12/2024

W-23984-2024

Time : 02:30 PM-05:30 PM
Max. Marks : 60

N.B :

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw neat and labeled diagrams **WHEREVER** necessary.
4) Use of non programmable **CALCULATOR** is allowed.
5) Assume suitable data if necessary.

Q.1 Compare MIMD and SIMD architecture and give its block diagram. **(10)**

OR

Q.1 What are the various reasons of demand of high computation speed? State main reasons behind increase in data volume that demands more powerful computing systems. **(10)**

Q.2 Consider a programme segment given below.

P = AxB Q =CxD R = P+Q S = P-Q

i) Draw Fine Grain Graph
ii) Find out number of instructions executed per cycle for software parallelism.
iii) Find out number of instruction executed per cycle with hardware parallelism, if we have single core systems, supporting 2-issue processor / cycle, that is 01 memory reference and 01 arithmetic operation, find out instruction executed per cycle.

OR

Q.2 What do you mean by "Blocking" and "Non-Blocking" way of message passing communication in parallel computation? Support your answer with suitable syntax of function and related diagrams. **(10)**

Q.3 Give concept of CENTRALIZED COUNTER based implementation of inter process synchronization. **(10)**

OR

Q.3 What is PREFIX Sum problem? Give related diagram and PSEUDO CODE for explanation Syntax and parameters used in send() and recv() function. **(10)**

Q.4 Why is designing of interconnection structure important for parallel computation? Give three technical reasons to explain how an interconnection structure important impact performance of parallel systems? **(10)**

OR

Q.4 How is a MESH structure over TREE structure for interconnection network? **(10)**

P.T.O.

Q.5 Explain and compare "RING TERMINATION" and TREE TERMINATION" algorithm for distributed terminal detection method used in parallel computing. (10)

OR

Q.5 To implement distributed terminal detection, we have "Acknowledge Method". Demonstrate its working via explaining ACTIVE and INACTIVE state of a process. (10)

Q.6 What are the major challenges in shared memory programming environment? (10)

OR

Q.6 A computing environment requires shared memory access. State technique for handling cache coherence. (10)

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