Total No. of Questions : 12] [Total No. of Pages :2

P1297

[3864] - 410

B.E. (Computer Engineering)

ADVANCED COMPUTER ARCHITECTURE AND COMPUTING

(2003 Course)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate books.***
2) ***Assume suitable data wherever necessary.***
3) ***Neat diagrams must be drawn wherever necessary.***

SECTION - I

Q1) a) Explain how the parallelism can be achieved in Uni-processor architecture. **[10]**

b) Discuss Instruction level and Thread level parallelism elaborately. **[8]**

OR

Q2) a) Give Flynn's, Feng's and Handler's classification schemes for Parallel Computers. **[12]**

b) Give any two applications of Parallel Processing. **[6]**

Q3) a) What is Superscalar Architecture, explain with an example of Ultra Sparc. **[8]**

b) Explain Internal Forwarding with proper example. **[8]**

OR

Q4) a) What is the net effect of Loop Unrolling technique? Discuss with an example. **[8]**

b) Discuss various pipeline hazards. Give Hazard detection and resolution techniques. **[8]**

Q5) a) Draw and explain the architecture of Cray-I. **[10]**

b) Explain in detail anyone Multistage Dynamic Interconnection Network used in Array processors. **[6]**

OR

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Q6) a) Explain parallel Matrix multiplication algorithm for SIMD architecture. **[10]**

b) Discuss the issues in designing Vectorizing Compiler. **[6]**

SECTION-II

Q7) a) Differentiate Loosely coupled and Tightly coupled Multiprocessors. What are the desirable characteristics of the processor contributing to Multiprocessing? **[10]**

b) Explain the architecture of IBM Power4 processor. **[8]**

OR

Q8) a) Briefly characterize the multicache problem and describe various methods that have been suggested to cope with the problem. Comment on the advantages and disadvantages of each method to preserve the coherence among multiple shared caches used in multiprocessor system. **[12]**

b) What are Multiport Memories? Explain in brief. **[6]**

Q9) a) What are the major issues confined to Multithreaded programming? Specify the appropriate solutions accordingly. **[8]**

b) What is Synchronous and Asynchronous Message passing in parallel programming? **[8]**

OR

Q10) a) Explain an architecture of a typical multithreaded processor. **[8]**

b) What is shared memory programming? Explain in detail. **[8]**

Q11) a) What are the characteristics of Parallel algorithms for Multiprocessors? **[6]**

b) What are the various performance measures for the parallel algorithms? **[6]**

c) Comment on PThreads in Shared memory system. **[4]**

OR

Q12) a) What are the issues in Multiprocessor Operating System? Discuss in detail. **[10]**

b) Write a note on Neuro-Computing Paradigms. **[6]**