Roll No. …… Total Pages:
10462

MCA/D-12
COMPUTER ARCHITECTURE AND PARRELEL PROCESSING
Paper-MCA-503

Time allowed: 3 hours Maximum marks: 80

Note: Attempt five questions in all. Question no. 1 is compulsory. In addition to this, Attempt four more questions selecting one question from each unit.

Compulsory Question

1. Answer the following questions in brief:
(a) What is hypercube? Give an example.
(b) What is perfect shuffle function? Explain it with a suitable diagram.
(c) What is Branch problem? Explain with time space diagram of the pipeline.
(d) What are characteristics of VLIW architecture?
(e) Explain pipeline processing of Load/Store instruction.
(f) Distinguish between Concrete and Abstract architecture of a computer
(g) Define microoperation, Microinstruction, Macroinstruction and Control memory.
(h) What are the limitations of sign-magnitude representation over2's complement Representation used in addition/subtraction algorithm? 8 x 3 = 24

Unit-I

2. (a) What is hardwired control? Explain one-hot method to design a hardwired control. 7
(b) What are horizontal and vertical microinstruction formats? Also discuss their pros And cons. 7
3. (a) Design a 4-bit by 3-bit array multiplier. 7
(b) Devise an algorithm in flow chart form to multiply two floating point numbers. Also Discuss register configuration to implement this algorithm. 7

Unit-II

4. (a) What is computational models? Explain Von Neumann computational model. 7
(b) What is computer architecture? Explain multilevel hierarchical framework of Computer architecture. 7
5. (a) Explain data dependencies among instructions with the help of examples. 7
(b) Explain global scheduling technique used in ILP processors. 7

Unit-III

6. (a) What is delayed branch handling technique? Explain it with the help of time-space Diagram of the pipeline. 7
(b) What is multiway branching? Explain its merits and demerits. 7
7. (a) What is shelving? Discuss layout of shelving buffers. 7
(b) What are the different types of rename buffers? Explain operand fetch policies Used in rename buffers. 7

Unit-IV

8. (a) What is Multicomputer? Discuss its general architecture. 7

(b) What are direct interconnection network? Explain 4x4 Wraparound 2D mesh. Also compute node degree, network diameter and bisection width for the network 7

9. (a) What is Cache coherence problem? Explain snoopy cache coherence protocol. 7

(b) Write short note on CC-NUMA model. 7