Total number of printed pages–4

53 (IT 714) ADCA

2021

(Held in 2022)

ADVANCED COMPUTER ARCHITECTURE

Paper : IT–714

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. *(i)* What is flow dependence ?

   (ii) What are the diameter and bisection width of a network ?

   (iii) What is a data flow computer ?

   (iv) What is parallel processing ?

   (v) State the limitations of sequential machines.

Contd.

(vi) What is very fine grain parallelism ?

(vii) What is data flow graph ? Draw the data flow graph for fork operation,

(viii) What is grain packing ?

(ix) What is resource dependence ?

(x) What is MIPS rate ?

2×10=10

2. (i) Discuss various mechanisms used in uniprocessor system to achieve the parallel processing. 10

(ii) Explain various parallel computer architectures with suitable diagrams. 10

3. (i) Discuss Flynn's classification on parallel architecture. 5

(ii) Identify various dependencies present in the following program segment :

S1: A = B+D
S2: C = A*3
S3: A = A+C
S4: E = A/2

Draw the dependence graph for the same. 5

(iii) Write the primary characteristics of a symbolic array topology. 5

(iv) Draw the data flow graph for the following statements : 5

If $x > y$ then $(x - y)$

else $(x * y)$

endif

4. (i) Show how parallel execution is more efficient than the sequential execution by considering the following five processes P1–P5 : 5

P1: C=D*E
P2: M=G+C
P3: A=B+C
P4: C=L+M
P5: F=G/E

(ii) State Bernstein's conditions for parallelism. 5

(iii) Write the differences between CISC and RISC instruction set architecture. 5

(iv) Explain the inclusion and coherence properties of computer memory. 5

5. (i) What is bus arbitration ? Discuss any three bus arbitration schemes with suitable diagrams. 10

(ii) What is paging ? Compare among FIFO, optimal and LRU page replacement algorithms considering suitable examples. 10

6. Write short notes on : ***(any four)*** 5×4=20

(i) Levels of parallelism

(ii) VLIW architecture

(iii) Locality of reference

(iv) Linear pipeline

(v) Data hazards