53 (IT 714) ACAR

2018

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. *(a)* Explain the conventional machine architecture with proper diagram. Discuss the differences between sequential computers and parallel computers. 5+5=10

   (b) Discuss various parallel processing mechanisms for uniprocessor systems. 10

2. *(a)* What are the differences between Multiprocessor and Multicomputer systems ? Discuss the classification of parallel computers with relevant diagram. 10

(b) Discuss the Feng's Classification and classification based on Grain size for parallel architecture. 5+5=10

3. (a) A program is run on a 40*MHz* CPU with different types of instructions and corresponding clock cycle count as mentioned in the below table. Determine : 10

(i) Effective CPI.

(ii) Execution Time.

(iii) MIPS rate for the program.

Instruction type	Clock Cycle count	Instruction count
1) Integer Arithmetic	1	45,000
2) Floating point	2	32,000
3) Data transfer	2	15,000
4) Control transfer	2	8,000

(b) Discuss RISC and CISC instruction set architecture. Write the pros and cons of VLIW architecture. 6+4=10

4. (a) What is locality of references ? Compare FIFO, optimal and LRU page replacement algorithms. 10

(b) What is bus arbitration ? Explain various bus arbitration schemes with advantage and disadvantage for each. 10

5. (a) What are the two types of linear pipeline ? Discuss the working and Space-Time diagram for linear pipeline. 10

(b) What is pipeline hazard ? Write briefly about the various types of data and control hazards. 10

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

(i) Flynn's classification

(ii) Amdahl's law

(iii) CDC 6600 architecture

(iv) Computer generation

(v) Instruction pipeline.

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