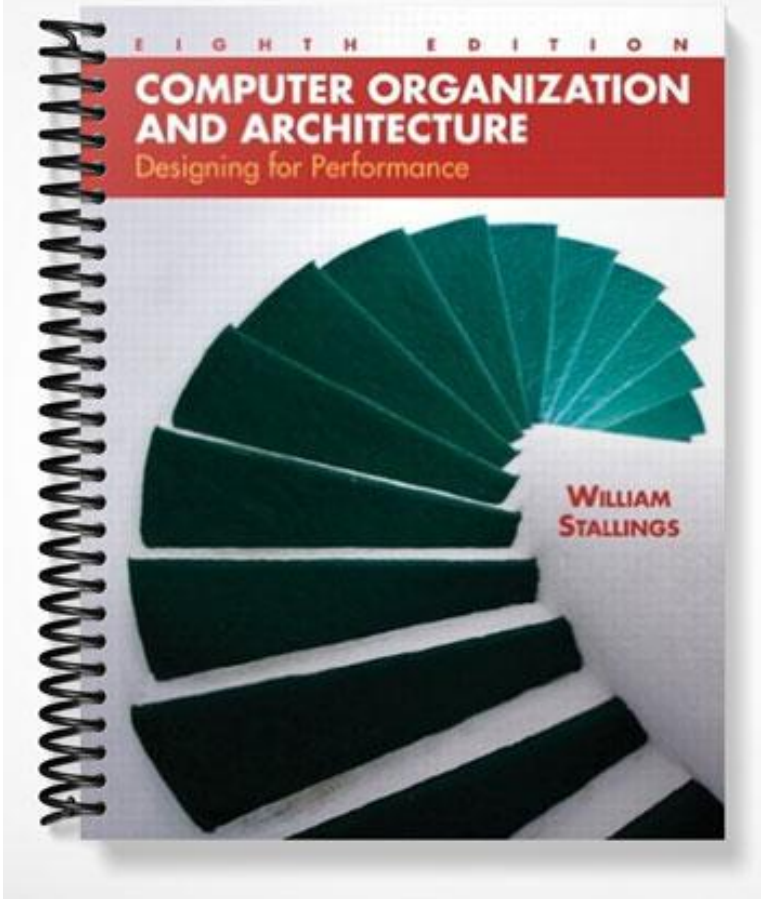
TEST BANK


EIGHTH EDITION
COMPUTER ORGANIZATION AND ARCHITECTURE
Designing for Performance
WILLIAM STALLINGS

Chapter 2 – Computer Evolution and Performance

True / False Questions:

1. T/F - The ENIAC was the world's first general purpose electronic computer built.

   ANS: T

2. T/F - The fundamental building block of the ENIAC machine was transistors.

   ANS: F

3. T/F - Binary system was used to represent arithmetic in the ENIAC.

   ANS: F

4. T/F - ENIAC was built primarily to help building the hydrogen bomb.

   ANS: F

5. T/F - The stored program concept is used in both ENIAC and Von-Neumann machines.

   ANS: T

6. T/F - The EDVAC machine primarily consisted of 4 core blocks.

   ANS: T

7. T/F - Moore's law predicts that every three years, the number of transistors in the chip quadruples.

   ANS: T

8. T/F - Processor and memory speeds, have increased the same amount with improvement in IC design.

   ANS: F

9. T/F - By increasing the clock speed and logic density, the power consumed by the chip is reduced.

   ANS: F

10. T/F - Modern instructions have become increasingly easy to parallelize.

    ANS: F

11. T/F - The Intelx86 architecture is CISC-based.

    ANS: T

12. T/F - Intel has not produced chips with architecture that run 64-bit instructions.

    ANS: F

13. T/F - The ARM processor is a special-purpose/embedded system processor that is used in a wide range of applications compared to the Intelx86-based processor.

    ANS: T

14. T/F - Performance is nothing but the raw speed of the processor.

    ANS: F

15. T/F - Each instruction takes multiple cycles to execute.

    ANS: T

16. T/F - According to Amdahl's law, the single processor runs at the same speed as a parallel processor.

    ANS: T

17. T/F - The CPI can be different for different instruction in the architecture.

    ANS: T

Multiple Choice Questions:

1. What number system was used in the ENIAC machine?

    A. Binary
    B. Decimal
    C. Octal
    D. Hexadecimal

    ANS: B

2. The Memory Address register stores the address of the word stored in which part of the architecture?

A. I/O
B. Program Counter
C. Memory Buffer Register
D. None of the above

ANS: C

3. Which part of the EDVAC architecture temporarily holds instructions?

A. Program Counter
B. Instruction Register
C. ALU Unit
D. Instruction Buffer Register

ANS: D

4. The five important parts of the Von Neumann Machine are:

A. Fetch Unit, ALU, Memory, Registers and I/O
B. Central Arithmetic, Central Control, Memory, Registers and I/O
C. Fetch Unit, Decode, ALU, Memory and I/O
D. Central Arithmetic, Fetch Unit, Control, Registers and Buses.

ANS: B

5. When is the execute cycle performed?

A. When instruction is fetched
B. After registers are decoded
C. When the opcode is in the Instruction register
D. When the instruction is buffered in the buffer register.

ANS: C

6. What is the second generation computers made?

A. Vacuum tubes
B. Integrated Circuits
C. Resistors
D. Transistors

ANS: D

7. What are the fundamental blocks of the third generation computers and what were they made of?

A. Integrated Circuits consisting of capacitors
B. Digital Circuits using vacuum tubes
C. Integrated Circuits made using transistors
D. None of the above

ANS: C

8. What did Moore's law predict about the density and size of future generation chips?

A. Density decreases and size doubles
B. Density increases drastically and size reduces
C. Density increases but size remains the same
D. No impact on size and density

ANS: B

9. What technology was used to create memories?

A. Vacuum tube based technology
B. Same integrated circuit technology as the processors
C. Capacitor based network technology
D. Inductive circuitry

ANS: B

10. Instructions can be speculatively executed using what two important steps?

A. Instruction fetching & decode
B. Speculative fetch and Branch prediction
C. Branch prediction and data analysis
D. None of the above

ANS: C

11. What changes can be done to the I/O buses to speedup the transfer of data between the processor and memory

A. Increase bus width
B. Decrease the frequency of transfer
C. Add buffers for the I/O
D. All of the above

ANS: D

12. Advances in integrated circuit technology can lead to the following detractors

A. Decrease in speed/ performance
B. Increase in power consumption and dissipation
C. All the above
D. None of the above

ANS: B

13. The Intel MMX technology was introduced with which core?

A. Pentium Pro
B. 80286
C. Pentium III
D. Pentium II

ANS: D

14. Which of the following depicts and Embedded system

A. Multi-core processor unit.
B. Application specific Core
C. Hardware Software Combination to perform specific application
D. All of the above

ANS: C

15. The performance of a processor can be measured using

A. Clock period
B. Cycles per Instruction
C. Throughput
D. All of the above

ANS: D

16. The speedup of a processor is estimated using which of the following parameters

A. Throughput
B. Execution time in one and N processors
C. Cycles per instruction in one and N processors
D. None of the above

ANS: B

Fill up the blanks:

1. The ENIAC was initially intended for making tables for estimating the _____ of missiles in the World War.

ANS: Trajectory

2. The ENIAC machine did not have the capability of _____ compared to the Von Neumann machine.

ANS: Storing data and instruction in memory

3. The _____ in the Von Neumann machine decodes instructions and helps execute them.

ANS: Central Control

4. The instruction set architecture has instructions that are classified into _____ different categories.

ANS: Five

5. The UNIVAC I primarily was validated by showing _____ for _____.

ANS: Statistical problems ; life insurance company

6. A data channel is an independent _____ with its own processor and _____.

ANS: I/O module; instruction set

7. The four basic functions of a computer are _____, _____, _____ and _____.

ANS: Data Storage, Data processing, Data movement and Control

8. The characteristic of a chip family include increasing _____, _____ ,_____ and _____.

ANS: Speed, Number of I/O ports, size and cost

9. Branch prediction is used to _____ predict whether the branch is _____ or _____.

ANS: speculatively; taken or not taken

10. As chip density increases, wires get closer and hence the _____ increases leading to higher _____.

ANS: Capacitance, RC delay

11. _____ occupies a major chunk of the chip area in a microprocessor.

ANS: Cache

12. _____ helps in increasing the performance of the system without changing the clock rate.

ANS: Multi-core

13. The Math co-processor was introduced in _____ to as a dedicated circuitry to perform math operations.

ANS: Intel 80486

14. The _____ based system involves a simple architecture but a complex compiler associated with it.

ANS: RISC

15. Amdahl's law is used to estimate the _____ of a processor.

ANS: Speedup

16. The _____ of a processor in the Amdahl's law is a function of the _____.

ANS: Speedup; program execution time