



KOGI STATE UNIVERSITY, KABBA

FACULTY OF SCIENCE AND COMPUTING (Department of Computer Science)

IFT 212: Computer Architecture and Organization

UNIT: 2C

Session: 2024/2025, Semester: Second Date: 18/08/2025 Time allowed: 2 Hours

Instructions: Answer ALL in Section A and any other Two Questions

Section A: ANSWER ALL QUESTIONS IN THIS SECTION

1. Computer architecture deals with

- A. Physical construction of computers
- B. Design and organization of computer systems
- C. Networking of computers
- D. Computer graphics

2. In BCD, decimal number 59 is represented as:

- A. 111011
- B. 0101 1001
- C. 1011001
- D. 0011 0101

4. Which is not a component of computer architecture?

- A. Control unit
- B. Arithmetic logic unit
- C. Database management system
- D. Memory

5. The term "ISA" in computer architecture stands for:

- A. Instruction Set Architecture
- B. Internal Storage Arrangement
- C. Integrated Software Application
- D. Internal Signal Analysis

6. The performance of a computer system is NOT directly affected by:

- A. Processor speed
- B. Instruction set design
- C. Operating system wallpaper
- D. Memory speed

7. Which level of computer architecture defines how instructions are implemented?

- A. High-level language
- B. Microarchitecture
- C. Application level
- D. Peripheral level

8. RISC stands for:

- A. Reduced Instruction Set Computer
- B. Regular Instruction Set Computer
- C. Random Instruction Set Compiler
- D. Repeated Instruction Set Cycle

9. CISC stands for:

- A. Complex Instruction Set Computer
- B. Compact Instruction Set Computer
- C. Complete Instruction Set Control
- D. Combined Instruction Set Compiler

10. Which of the following is true about RISC?

- A. Uses more complex instructions
- B. Executes one instruction per cycle
- C. Uses microcode extensively
- D. Has fewer registers

11. A major advantage of CISC is:

- A. Simpler compiler design
- B. Faster per clock cycle in all cases
- C. Smaller instruction set
- D. Requires more registers

12. Which architecture is commonly used in mobile devices?

- A. ARM
- B. x86
- C. MIPS
- D. SPARC

13. Mobile device architecture is optimized for:

- A. High heat dissipation
- B. Low power consumption
- C. High voltage operation
- D. Desktop performance only

14. Which is a key feature of mobile architecture?

- A. Multiple cores
- B. Energy efficiency
- C. High latency memory
- D. Fixed function logic only

15. The ARM architecture is based on:

- A. CISC
- B. RISC
- C. Harvard only
- D. Microcode

16. In mobile devices, SoC stands for:

- A. System of Communication
- B. System on Chip
- C. Storage on Card
- D. Signal over Channel

17. In IEEE 754 single-precision, how many bits are used for the exponent?

- A. 8
- B. 10
- C. 16
- D. 23

18. Registers are located in:

- A. RAM
- B. CPU
- C. Hard disk
- D. Cache only

19. The mantissa in IEEE 754 single-precision uses:

- A. 10 bits
- B. 16 bits
- C. 23 bits
- D. 8 bits

20. The exponent in IEEE single-precision has a bias of:

- A. 127
- B. 128
- C. 255
- D. 1023

21. Floating-point representation is mainly used for:

- A. Integer arithmetic
- B. Fractional and real numbers
- C. Character representation
- D. Boolean logic

22. The sign bit in floating-point representation determines:

- A. Magnitude
- B. Sign of the number
- C. Exponent bias
- D. Mantissa size

23. Which type of register holds the address of the next instruction?

- A. MAR
- B. PC

C. IR

D. MDR

24. The Instruction Register (IR) stores:

- A. Data fetched from memory
- B. Address of data
- C. Currently executing instruction
- D. Status flags

25. General-purpose registers are used to:

- A. Store instructions only
- B. Hold temporary data
- C. Keep only memory addresses
- D. Perform permanent storage

26. The register that stores intermediate arithmetic results is:

- A. Accumulator
- B. PC
- C. IR
- D. MAR

92
23
115
23

b. Describe Instruction Pipelining. (4 marks)

SECTION B: ANSWER TWO QUESTIONS (20 marks each)

1. a. Explain the Fetch-Decode-Execute cycle and outline the role of the control unit in each stage.

b. Define the following components of the data path:

- i. Arithmetic Logic Unit (ALU)
- ii. Registers
- iii. Buses

2. a. A digital computer has 16 registers of 32 bits each connected to a common bus system.

- i. How many selection inputs are needed for each multiplexer?
- ii. What is the size of each multiplexer?
- iii. How many multiplexers are required?

b. Differentiate between microprogrammed control and hardwired control in CPU design. Mention one advantage and one disadvantage of each.

3. a. What is Register Transfer Language (RTL) and why is it important in the design of a digital computer system?

b. Write a simple assembly language program to display the character 'B' using INT 21h with AH = 02h.

4. Draw and label the Von Neumann computer architecture diagram. Briefly explain the function of the following components:

- i. Control Unit
- ii. Memory Unit
- iii. ALU
- iv. Buses