BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – BCA-Hons-2023
Course Name – Computer Architecture
Course Code - VAC00003
(Semester II)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Identify which flip-flop type is commonly used for frequency division multiplexing?

a) D flip-flop b) T flip-flop
c) JK flip-flop d) SR flip-flop

(ii) How many flip-flops are needed to construct a Mod-4 Counter?

a) 2 b) 3
c) 4 d) 1

(iii) What is the primary purpose of a register in a computer system?

a) To perform arithmetic operations b) To store data temporarily
c) To connect the CPU to memory d) To execute instructions

(iv) Which of the following is true about an synchronous counter?

a) It requires an external clock signal. b) It has not a fixed count sequence.
c) It is also known as a parallel counter. d) It is slower than a asynchronous counter.

(v) Select how many flip-flop are required to create a counter of state 0,1,3,8,2.

a) 4 b) 3
c) 5 d) 2

(vi) In a typical memory hierarchy, select the closest to the CPU and is the fastest but also the smallest in capacity.

a) Main Memory b) Cache Memory
c) Secondary Storage d) Virtual Memory

(vii) Select which type memory typically used for long-term storage of data and programs, has a larger capacity, and slower access times compared to cache and main memory.

a) Cache Memory b) Main Memory
c) Secondary Storage d) RAM

(viii) Which is not a common type of hard disk interface?

a) SATA
b) USB
c) SCSI
d) IDE

(ix) Select an example of a solid-state drive (SSD).

a) SATA
b) HDD
c) CD-ROM
d) Blu-ray

(x) Select the volatile memory type from the following options.

a) ROM
b) RAM
c) EEPROM
d) Flash memory

(xi) Select the memory type that retains its data even when the power is turned off.

a) RAM
b) ROM
c) Cache memory
d) Virtual memory

(xii) Identify the primary function of ROM (Read-Only Memory) in computer systems.

a) To provide temporary storage for data during program execution
b) To store frequently accessed data and instructions for quick access
c) To store the BIOS (Basic Input/Output System) and firmware
d) To expand the capacity of physical memory

(xiii) What is the main difference between RAM (Random Access Memory) and secondary storage devices like hard disk drives (HDDs)?

a) RAM is volatile, while secondary storage is non-volatile.
b) RAM has slower access times compared to secondary storage.
c) RAM is less costly compared to secondary storage
d) RAM has a larger storage capacity compared to secondary storage.

(xiv) In what format does the accumulator unit typically store data?

a) Binary
b) Decimal
c) Hexadecimal
d) Octal

(xv) Identify the type of memory that is directly accessible by the CPU.

a) Primary Memory
b) Secondary Memory
c) Tertiary Memory
d) Auxiliary Memory

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Describe cache coherence and its importance in multi-core systems. (3)
3. Construct Von neumann Architecture. (3)
4. Explain the concept of a stack in computer architecture. (3)
5. Illustrate different types of registers. (3)
6. Illustrate the significance of General Register Organization in computer architecture. (3)

OR

Illustrate the role of conditional branching in program control. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Summarize the differences between RISC and CISC architectures in microprocessors. (5)
8. Explain the concept of immediate addressing mode construct one example. (5)
9. Describe the concept of memory-mapped I/O in the context of the Intel 8085 microprocessor. (5)
10. Explain the interrupt handling mechanism in the Intel 8085 microprocessor. (5)
11. Categorize and explain the types of cache mapping techniques in computer architecture. (5)
12. Compare and contrast the advantages and disadvantages of one address, two address, and three address instruction formats. (5)

OR

Assess the efficiency of two-address instructions versus three-address instructions concerning memory usage. (5)

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