BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – Dip.EE-2022
Course Name – Microprocessor and Microcontroller
Course Code - DEEPE501A
(Semester V)

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) Choose the primary function of a microprocessor.
a) Execute instructions and perform data processing
b) Store data and run applications
c) Display graphics and images
d) Connect to the internet and browse websites

(ii) Indicate the primary focus of microprocessor generation.
a) Increasing clock speed
b) Enhancing architectural features
c) Reducing power consumption
d) Expanding peripheral connectivity

(iii) Define the flag in the flag register of the Intel 8085 to indicate overflow.
a) OV (Overflow Flag)
b) CY (Carry Flag)
c) Z (Zero Flag)
d) S (Sign Flag)

(iv) In the Intel 8085 architecture, select the pin used to indicate the start of an instruction cycle.
a) S0
b) S1
c) RD
d) WR

(v) Indicate that the instruction in the Intel 8085 is used to transfer data from one register to another without affecting the flags.
a) MOV
b) MVI
c) XCHG
d) STAX

(vi) Identify the function of the ALE (Address Latch Enable) pin in the Intel 8085.
a) It enables the address bus during the first clock cycle of a machine cycle.
b) It enables the data bus during memory operations.

c) It is used to read the status of the accumulator.
d) It controls the clock frequency of the microprocessor.

(vii) Identify the primary purpose of the Flag Register in the 8086 microprocessor.
a) To store memory addresses
b) To perform arithmetic calculations
c) To manage I/O operations
d) To indicate the status of the processor and control operations

(viii) Indicate which of the following is a general-purpose register in the 8086 microprocessor.
a) IP (Instruction Pointer)
b) SP (Stack Pointer)
c) AX (Accumulator Register)
d) CS (Code Segment Register)

(ix) Identify the role of the "fetch" machine cycle in the 8085 microprocessor.
a) To execute the instruction
b) To decode the instruction
c) To fetch the instruction opcode from memory
d) To store the instruction in memory

(x) Determine which signal in the timing diagram of the 8085 microprocessor is active-low during the execution of memory and I/O read operations.
a) RD
b) WR
c) S1
d) S2

(xi) Indicate the WR (write) signal in the timing diagram of the 8085 microprocessor.
a) It indicates the beginning of a read operation
b) It indicates the beginning of a write operation
c) It signifies the execution of an instruction
d) It indicates the power supply status

(xii) Define the purpose of the PUSH instruction in 8051 assembly language.
a) To add data to a register
b) To store data on the stack
c) To move data between registers
d) To clear the accumulator

(xiii) Select what the instruction 'SJMP LABEL' does in 8051 assembly.
a) Jumps to the subroutine at LABEL
b) Jumps to the label if a condition is met
c) Jumps to the label unconditionally
d) Stops the execution of the program

(xiv) In block transfer DMA, indicate how data is transferred.
a) In fixed-size blocks
b) One byte at a time
c) Using interrupts
d) Through CPU polling

(xv) Identify which of the following is true about asynchronous data transfer.
a) It uses a common clock for all devices.
b) It can lead to timing issues due to variability.
c) It requires tight coupling between devices.
d) It always operates at a fixed rate.

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Define bit, byte, and word. (3)

3. Write a list of the various addressing modes of 8086. (3)

4. Write a list of the software and hardware interrupts for 8085. (3)

5. Define how clock signals are generated in 8085, and what is the frequency of the internal clock? (3)

6. Write an assembly language program to convert two-digit BCD (8-bit) data to binary data. (3)

OR

Write an assembly language program to convert 8-bit binary data to BCD. The binary data is stored in 4200H. Store the hundred's digit in 4252H, the ten's digit in 4251H, and the unit's digits in 4250H. (3)

Group-C
(Long Answer Type Questions) 5 x 6=30

7. Write the difference between the maximum mode and minimum mode configurations of the 8086. (5)

8. With a neat PIN diagram, describe the various signals of the 8085 microprocessor. (5)

9. Explain how the instructions are classified on the 8085 microprocessor. (5)

10. Explain the timing diagram for STA 526AH. (5)

11. Describe the three control flags of 8086. (5)

12. Explain the development and classification of microcontrollers. (5)

OR

Categorize jump instructions used in 8051. (5)

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