MADE EASY PUBLICATIONS

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CONTENTS

MECHANICAL ENGINEERING

Objective Practice Sets

Robotics and Mechatronics

1. Microprocessor, Microcontroller, PLC ..... 2 - 10
2. Sensor and Other Device ..... 11 - 22
3. Actuators and Steeper Motors ..... 23 - 31
4. Control System ..... 32 - 37
5. Robotics ..... 38 - 48

1 CHAPTER
Microprocessor, Microcontroller, PLC

Q.1 Consider the following statements comparing static RAM with dynamic RAM:
1. In static RAM typical cell requires more number of transistors than dynamic RAM.
2. Power consumption per bit of static RAM is less than that of dynamic RAM.

Which statements is/are correct?
(a) 1 and 2 only (b) 1 only
(c) 2 only (d) None of these

Q.2 A register of microprocessor which keeps track of the execution of a program and which contains memory address of the next instruction to be executed is called
(a) Index register
(b) Memory address register
(c) Program counter
(d) Instruction register

Q.3 In microprocessor the register which holds address of the next instruction to be fetched is
(a) accumulator (b) program counter
(c) stack pointer (d) instruction register

Q.4 Which of the following statements are correct?
1. DRAM offers reduced power consumption.
2. An associative memory is cheaper than RAM.

(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) None of these

Q.5 The program counter (PC) in a microprocessor
(a) counts the number of program being executed by the microprocessor.
(b) counts the number of instruction being executed by the microprocessor.
(c) count the number of interrupts handled by the microprocessor.
(d) keeps the address of the next instruction to be fetched.

Q.6 Consider the following register:
1. Accumulator and B register
2. B and C register
3. D and E register
4. H and L register

Which of these 8-bit registers of 8085 microprocessor can be paired together to make a 16-bit register?
(a) 1, 3 and 4 (b) 2, 3 and 4
(c) 1 and 2 (d) 1, 2 and 3

Q.7 A memory system has a total of 8 memory chips each with 12 address lines and 4 data lines. The size of memory system is
(a) 16 kB (b) 32 kB
(c) 48 kB (d) 64 kB

Q.8 Which statements is/are correct?
1. A processor can reference a memory stack without specifying an address.
2. The address is always available and automatically updated in the stack pointer.

(a) 1 only
(b) 2 only
(c) Both 1 and 2 and 2 explains 1
(d) Both 1 and 2 but 2 does not explain 1

Q.9 In 8085 microprocessor, the value of the most significant bit of the result following the execution of any arithmetic or Boolean instruction is stored in the
(a) Carry status flag
(b) Auxiliary carry status flag
(c) Sign status flag
(d) Zero status flag

Q.10 The address bus of Intel 8085 is 16 bit and hence the memory which can be accessed by this address bus is
(a) 1 kB (b) 16 kB
(c) 32 kB (d) 64 kB

Q.11 A microprocessor based system can perform many different function because
(a) Its operation is controlled by software
(b) It is digital system
(c) It uses a RAM
(d) It can be controlled by input and output device

Q.12 Which of the following are included in architecture of a computer?
1. Addressing mode, CPU
2. Instruction mode, data formats
3. Secondary memory, operating system.

Select the correct answer using the codes below:
(a) 1 and 2 (b) 3 and 1
(c) 2 and 3 (d) 3 only

Q.13 Which of the following is/are correct statements?
1. Bus is a group of wires carrying information.
2. Bus is needed to achieve reasonable speed of operation.
3. Bus can carry data or address.
4. A bus can be shared by more than one device.

Select the correct answer using the codes below:
(a) 1 only (b) 1 and 2 only
(c) 2, 3 and 4 only (d) 1, 2, 3 and 4

Q.14 Which of the following is correct?
A micro program
(a) is usually written in high level language.
(b) is a program for micro computer.
(c) is a program written in assembly language.
(d) is a sequencing program for the control unit of any processor.

Q.15 The following register holds the instruction before it goes to decoder
(a) Control register (b) Accumulator
(c) Address register (d) Data register

Q.16 ROM is used to store table for multiplication of two 8-bit unsigned integer. The size of the ROM required is
(a) 256k × 8 (b) 64k × 8
(c) 4k × 16 (d) 64k × 16

Q.17 The 8085 has two registers known as primary data pointer. These are registers
(a) B and C (b) D and E
(c) H and L (d) C and D

Q.18 Ready signal in 8085 is useful when the CPU communicates with
(a) A slow peripherals devices
(b) A fast peripherals device
(c) A DMA controller chip
(d) A PPI chip

Q.19 Which of the following register of 8085 microprocessor is not a part of programming model?
(a) Instruction register
(b) Memory address register
(c) Status register
(d) Temporary data register

Q.20 The computer program which converts statement written in high level language to object code is known as
(a) Assembler (b) Compiler
(c) Disassembler (d) Operating system

Q.21 In an assembler, which of the following is required for variable name in symbol table?
(a) Address (b) Values
(c) Register (d) Storage

Q.22 Which of the following flags is not used for branching in a microprocessor?
(a) Carry flag (b) Auxiliary carry flag
(c) Overflow flag (d) Parity flag

Q.23 As compared to 16 bit microprocessor; 8 bit microprocessor are limited in
1. Speed
2. Directly addressable memory
3. Data handling capability

(a) 1 and 2 only (b) 2 and 3 only
(c) 1 and 3 only (d) 1, 2 and 3

Q.24 What is the address space of 8086 CPU?
(a) One megabyte (b) 256 kilobyte
(c) 1k megabyte (d) 64 kilobytes

Q.25 Which of the following is incorrect for a microprocessor?
1. It has ALU, CU and register.
2. It has interfacing circuits, timers.
3. It has internal memory.

(a) 1 and 2 (b) 2 and 3
(c) 1 only (d) 1, 2 and 3

Answers Microprocessor, Microcontroller, PLC

1. (a)	2. (c)	3. (b)	4. (a)	5. (d)	6. (b)	7. (a)	8. (d)	9. (c)
10. (d)	11. (a)	12. (a)	13. (d)	14. (c)	15. (a)	16. (d)	17. (c)	18. (a)
19. (d)	20. (b)	21. (c)	22. (b)	23. (d)	24. (a)	25. (b)	26. (d)	27. (c)
28. (d)	29. (a)	30. (d)	31. (d)	32. (c)	33. (a)	34. (c)	35. (a)	36. (d)
37. (d)	38. (c)	39. (b)	40. (b)	41. (b)	42. (a)	43. (c)	44. (a)	45. (c)
46. (a)	47. (a)	48. (b)	49. (d)	50. (c)	51. (d)	52. (a)	53. (d)	54. (c)
55. (d)	56. (a)	57. (b)	58. (a)	59. (c)	60. (c)			

Explanations Microprocessor, Microcontroller, PLC

1. (a)

Static RAM
- Never refreshed
- Fast
- More expensive
- Require 4 or 6 transistor along with some wiring

Dynamic RAM
- Frequent refresh
- Slow
- Less expensive
- Require a transistor and a capacitor

2. (c)

Program counter is a register that keeps track of the execution of a program and stores the address of the next instruction to be fetched/executed.

3. (b)

Program counter : In microprocessor program counter (PC) hold address of the next instruction which is to be fetched.

4. (a)

DRAM offers reduced power consumption as the information is stored in capacitor fastest.
Associative memory is more expensive than RAM because each all must have an extra storage capability as well as logic circuits formatting its content with external arrangement.

5. (d)

Program counter (PC) : It is a 16 bit register which is user accessible. It keeps the track of address of the next instruction to be fetched from memory for execution

6. (b)

8-bit register paired together to make 16 bit register are
B and C register
D and E register
H and L register
Note: Accumulator (A) and flag register can be clubbed together to form a 16 bit register called program status work (PSW).

7. (a)

Number of memory location in each chip = 2^{12}
Number of bits in each chip = $2^{12} \times 4$ bits
Total number of bits in memory system
$= 8 \times 4 \times 2^{12}$ bits
$= 4 \times 2^2 \times 2^{10}$ bytes
= 16k bytes [1 byte = 8 bit]

8. (d)

Stack pointer (SP) always keeps the address of stack-top. Stack pointer keeps updating its value automatically during stack operations.

9. (c)

The flag register have five different flag bit as below:

D_7	D_6	D_5	D_4	D_3	D_2	D_1	D_0
S	Z	X	AC	X	P	X	CY

1. Sign flag (*s*)
2. Zero flag (*z*)
3. Auxiliary flag (*AC*)
4. Parity flag (*P*)
5. Carry flag (*C*)

10. (d)

Memory accessed by address bus
$= 2^{(\text{number of address lines})}$
$= 2^{16} = 2^{10} \times 2^{6}$
$= 64\text{k bytes}$

11. (a)

It can perform many function because its operation is controlled by software and it can be programmed to perform desired tasks.

12. (a)

Secondary memory and operating system are not the part of computer architecture.

14. (c)

Microprogram is written in assembly language by the designer. It consists only of basic elemental Comments which directly control the operation or each functional element in a microprocessor.

15. (a)

Control register: It hold the instruction before it goes to decoder. It is same times also called as instruction register.

Accumulator: It acts as one source of operant to ALU and as destination to result.

Address register: it holds address of some location of memory.

Data register: It hold certain data.

16. (d)

$$\begin{bmatrix}\text{8-bit}\\ \text{unsigned}\\ \text{number}\end{bmatrix} \times \begin{bmatrix}\text{8-bit}\\ \text{unsigned}\\ \text{number}\end{bmatrix} = \begin{bmatrix}\text{16-bit}\\ \text{unsigned}\\ \text{number}\end{bmatrix}$$

To store 16-bit unsigned number $\Rightarrow$ 16 bit.
For 16 bit $\Rightarrow 2^{16}$ number can be possible.
Hence to store 216 number, each of 16-bit we require $2^{16} \times 16$ bit = 64 k $\times$ 16 bit

17. (c)

Primary data pointer register is (HL) pair register.

18. (a)

When a slow peripheral device communicates with CPU, the CPU has to wait for the peripheral device. The peripheral device make the CPU wait by putting 'low' the ready signal.

19. (d)

Temporary data register and W and Z register are not accessible to programmer but 8085 uses them internally to hold temporary data during execution of some instructions.

20. (b)

A complier is a computer program that translate code written in a high level language to a lower level language i.e., object/machine code.

21. (c)

Register is used to store variable name in symbol table.

22. (b)

We can see that for all other flags jumps instructions are present but not for auxiliary carry flag. Hence it is not used for branching instructions in a microprocessor.

23. (d)

- Directly addressable memory = 2 (number of address bus)
- Data handling capacity increases as size of ALU increase.
- Speed increase as number of data bus increase.

24. (a)

Number of address line of 8086 = 20
Size of memory = 2^{20} = 1 Mbytes

25. (b)

Microprocessor do not have interfacing circuits, timers, and it also do to have internal memory

26. (d)

Maximum memory that can be connected or interfaced $= 2^{36}$
$= 2^{6} \cdot 2^{10 \times 3}$
$= 64 \times (\text{GB})$
$= 64\text{ GB}$

27. (c)

Register array

- Registers are small storage devices that are available to CPU or processors.
- They act as temporary storage for processing of intermediate data by mathematical or logical operations.