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ELECTRONICS ENGINEERING

Objective Practice Sets

Microprocessors

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Introduction to 8085 and its Functional Organisation

- Q.1** Microprocessor 8085 is the enhanced version of ____ with essentially the same construction set.
- (a) 6800 (b) 68000
(c) 8080 (d) 8000
- Q.2** The data bus in 8080A / 8085 microprocessor is a group of
- (a) eight bidirectional lines that are used to transfer 8 bits between the microprocessor and its I/O and memory
(b) eight lines used to transfer data among the registers
(c) eight unidirectional lines that are used for I/O devices
(d) sixteen bidirectional lines that are used for data transfer between the microprocessor and memory
- Q.3 Assertion (A):** The development of a microprocessor based product requires the design of program and the hardware.
Reason (R): The design effort for an electronic product follows the same basic steps used in the development of software.
- (a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true but R is NOT the correct explanation of A
(c) A is true but R is false
(d) A is false but R is true
- Q.4** The output data lines of microprocessors and memories are usually tristated, because
- (a) More than one device can transmit information over the data bus by enabling only one device at a time
(b) More than one device can transmit information over the data bus at the same time
(c) The data lines can be multiplexed for both input and output
(d) It increases the speed of data transfers over the data bus
- Q.5** Machine instructions are written using which of the following?
- (a) Bits 0 and 1 only
(b) Digits 0 to 9 only
(c) Digits 0 to 9 and the capital alphabets A to Z only
(d) Digits 0 to 9, the capital alphabets A to Z and certain special characters
- Q.6 Assertion (A):** Many programmes prefer assembly level programming to machine language programming.
Reason (R): It is possible to efficiently utilise the hardware of the computer in machine language programming.
- (a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, but R is not a correct explanation of A.
(c) A is true, but R is false.
(d) A is false, but R is true.
- Q.7** Which one of the following statements is correct? A microcontroller differs from a microprocessor in that it has
- (a) both on-chip memory and on-chip ports.
(b) only on-chip memory but not on-chip ports.
(c) only on-chip ports but not on-chip memory.
(d) neither on-chip memory nor on-chip ports.
- Q.8** What is the function of a program counter in an 8-bit microprocessor?
- (a) To store the op-code of the instruction being executed
(b) To store the op-code of the next instruction
(c) To store the address of the instruction being executed
(d) To store the address of the next instruction
- Q.9** When an application is designed using a microcontroller it has the following advantages over a design based on a microprocessor :

1. Its chip count is less.
2. It is more fault tolerant.
3. It is cheaper.

Which of these are correct?

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

Q.10 An 'Assembler' in a microprocessor is used for
(a) assembly of processors in a production line
(b) creation of new programs using different modules

- (c) translation of a program from assembly language to machine language
(d) translation of a higher level language into English text

Q.11 What is the direction of control bus?

- (a) Unidirectional into microprocessor
(b) Unidirectional out of microprocessor
(c) Bidirectional
(d) Mixed direction i.e. some lines into microprocessor and some others out of microprocessor

Q.12 Which one of the following statements is correct?
A microprocessor program written in assembly language is translated into machine language. The number of instructions in the machine language when compared with the number of instructions in assembly language is

- (a) More only (b) Same
(c) Less only (d) Either more or less

Q.13 The synchronisation between microprocessor and memory is done by

- (a) ALE signal (b) HOLD signal
(c) READY signal (d) None of these

Q.14 The stack pointer in the 8085 microprocessor is a

- (a) 16 bit register that point to stack memory locations
(b) 16 bit accumulator
(c) memory location in the stack
(d) flag register used for the stack

Q.15 Consider the following registers:

1. Accumulator and B register
2. B and C registers
3. D and E registers
4. H and L registers

Which of these 8-bit registers of 8085 μ P 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.16 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.17 Statement (I): On executing the HLT instruction, the microprocessor enters into a halt state and all the buses are tri-stated.

Statement (II): On executing the HLT instruction, the microprocessor is disconnected from the system bus till the reset is pressed.

- (a) Both Statement I and Statement II are individually true and Statement II is the correct explanation of Statement I
(b) Both Statement I and Statement II are individually true but Statement II is not the correct explanation of Statement I
(c) Statement I is true but Statement II is false
(d) Statement I is false but Statement II is true

Q.18 Statement (I): In an 8085 microprocessor, an input port and an output port can have same port address.

Statement (II): \overline{RD} is used to enable the input port and \overline{WR} is used to enable the output port.

Q.19 Match **List-I** with **List-II** and select the correct answer using the codes given below the lists:

List-I

- A. Monitor program
B. Assembler
C. Mnemonic
D. Program counter

List-II

1. Used to indicate memory location
2. A combination of letters, symbols and numerals
3. A program that translates symbolic instructions into binary equivalent
4. An operating system

Codes:

- | | A | B | C | D |
|-----|---|---|---|---|
| (a) | 4 | 3 | 2 | 1 |
| (b) | 4 | 3 | 1 | 2 |
| (c) | 3 | 4 | 1 | 2 |
| (d) | 3 | 4 | 2 | 1 |

- Q.28** Three devices A, B and C are connected to an Intel 8085 A microprocessor. Device A has the highest priority and device C has the lowest priority. The correct assignment of interrupt inputs is
(a) A uses RST 5.5, B uses RST 6.5 and C uses TRAP
(b) A uses RST 5.5, B uses RST 6.5 and C uses RST 7.5
(c) A uses TRAP, B uses RST 6.5 and C uses RST 5.5
(d) A uses TRAP, B uses RST 5.5 and C uses RST 7.5
- Q.29** An 8085 μ p based system drives a multiplexed 5-digits 7-segment display. The digits are refreshed at a rate of 500 Hz. The ON time for each digit is
(a) 4 ms (b) 0.4 ms
(c) 10 ms (d) 25 ms
- Q.30** A memory chip can be represented as 8192×32 . If there are p number of address lines and q number of data lines for the memory chip, then $q-p$ will be equal to _____.
- Q.31** In 8085 microprocessor, RST- n instruction is executed. If the vector address location corresponding to the RST- n instruction is 0038 H, then the value of n is _____.
- Q.32** An 8085 microprocessor is using a crystal frequency of 5 MHz. The duration of one T-state would be _____ ns.
- Q.33** In 8085 microprocessor, the interrupt which is both edge as well as level sensitive has vector address of (_____) ₁₀.



Answers Introduction to 8085 and its Functional Organisation

1. (c) 2. (a) 3. (b) 4. (a) 5. (a) 6. (b) 7. (a) 8. (d) 9. (a)
10. (c) 11. (d) 12. (b) 13. (c) 14. (a) 15. (b) 16. (c) 17. (a) 18. (a)
19. (a) 20. (d) 21. (d) 22. (d) 23. (b) 24. (a) 25. (d) 26. (b) 27. (a)
28. (c) 29. (b) 30. (19) 31. (7) 32. (400) 33. (36)

Explanations Introduction to 8085 and its Functional Organisation

1. (c)

8085 is advanced version of Intel 8080.

2. (a)

Data bus is of 8-bits and bidirectional and transfer data between microprocessor and memory/IO.

3. (b)

Assertion (A): Microprocessor development requires the design of program and hardware.

Reason (R): Electronic product also follows the same basic steps used in software development. Both A and R are correct but R is NOT the correct explanation of A.

4. (a)

The output data lines of microprocessor and memories are tristate because more than one device can transmit information over the data bus by enabling only one device at a time.

5. (a)

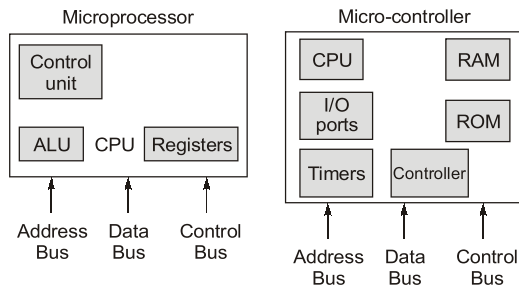
A programme written with 0's and 1's is called machine language programme. However sometime to facilitate programmer, machine code can be written in hexadecimal numbers.

6. (b)

Assembly language programmes are written in mnemonics with word like ADD for addition. It is convenient and easy as compared to machine language written in binary codes or in hexadecimal. Machine language is faster as it is the language of microprocessor. It is written in 1's and 0's e.g. in 8085 to add contents of register A and register B, binary code is 10000000. So, time and resources required for conversion of assembly language into machine code is saved. Hence it uses hardware efficiently.

7. (a)

Microcontroller has on-chip memory as well as on chip ports.



8. (d)

It is used to store 16-bit address of the next byte to be fetched from memory or address of the next instruction to be executed.

9. (a)

A microcontroller is an embedded system with some specific functions like vending machine, electronic parking meters. The processor has to perform simple and low grade computational functions. So the process is simple and cheaper. Its chip count i.e. number of chips circuitry is less. A microcontroller is put into function once and the system where it is used is rugged. No changes or complexities are required. It is immune to virus attacks. So it is more to be fault tolerant.

10. (c)

An 'Assembler' is used for translation of a program from assembly language to machine language.

11. (d)

Control bus have some lines into microprocessor and some out of microprocessor.

12. (b)

A program written in assembly language is translated into machine language. Number of instructions in assembly and machine language is same.

13. (c)

READY is an active high pin used to interface slow peripheral devices with 8085.

14. (a)

Stack pointer is of 16-bit register and it points to the stack memory locations and generally used in case of interrupt or PUSH, POP instructions.

15. (b)

Register pairs are BC, DE and HL,

16. (c)

MSB is stored in sign flag.

17. (a)

Reason is correct explanation of assertion.

18. (a)

Reason is correct explanation of assertion as with the help of \overline{RD} and \overline{WR} we can differentiate between input and output ports.

19. (a)

Program counter: Indicates memory location to which next instruction to be fetched.

Monitor program: An operating system.

Assembler: Converts machine language to binary equivalent.

20. (d)

All the statements are true.

21. (d)

Interrupt which has fixed address location is said to be vectored and which can be delayed or rejected is known as maskable.

22. (d)

In a microprocessor when a CPU is interrupted, it acknowledges interrupt by INTA signal and then waits for the next instruction to be fetched by interrupting device.

23. (b)

- | | |
|---------|-----------------------------------|
| TRAP | ⇒ Both Level and Edge - sensitive |
| RST 7.5 | ⇒ Edge - sensitive |
| RST 6.5 | ⇒ Level - sensitive |
| RST 5.5 | ⇒ Level - sensitive |

24. (a)

The following actions are performed by 8085 RESET instruction.

- PC contents become 0000 H
- IR contents become 00 H
- All interrupts are disabled except TRAP.