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## Programming of Microprocessors



### Multiple Choice Questions

**Q.1** An 8085 microprocessor executes "STA 1234 H" with starting address location 1FFE H (STA copies the contents of the Accumulator to the 16-bit address location). While the instruction is fetched and executed, the sequence of values written at the address pins  $A_{15} - A_8$  is

- (a) 1F H, 1F H, 20 H, 12 H
- (b) 1F H, FE H, 1F H, FF H, 12 H
- (c) 1F H, 1F H, 12 H, 12 H
- (d) 1F H, 1F H, 12 H, 20 H, 12 H

[GATE-2014]

**Q.2** The stack pointer of an 8085 micro-processor is ABCD H. At the end of execution of the sequence of instructions, what will be the content of the stack pointer?

PUSH PSW

XTHL

PUSH D

JMP FC70 H

- (a) ABCB H                      (b) ABCA H
- (c) ABC9 H                      (d) ABC8 H

[IES-2009]

**Q.3** In an 8085 microprocessor, the contents of accumulator, after the following instructions are executed will become

XRA A

MVI B, F0 H

SUB B

- (a) 01 H                      (b) 0F H
- (c) F0 H                      (d) 10 H

**Q.4** Consider the following 8085 instructions :

ANA A, ORA A, XRA A, SUB A, CMP A

Now consider the following statements :

- 1. All are arithmetic and logic instructions
- 2. All cause the accumulator to be cleared irrespective of its original contents
- 3. All reset the carry flag
- 4. All of them are 1 byte instructions

Which of these statements is/are correct ?

- (a) 1, 2, 3 and 4              (b) 2 only
- (c) 1, 2 and 4                (d) 1, 3 and 4

[IES-2005]

**Q.5** Consider the following 8085 microprocessor program

FF00 H : MVI A, DC H

ORA A

LXI H, FF08 H

SUB M

OUT A2 H

HLT

After execution of the command HLT, data displayed at output port A2 H is

- (a) 3A H
- (b) DC H
- (c) A2 H
- (d) Can't be determined due to insufficient data

**Q.6** Consider the following program to be executed in INTEL 8085 starts at 3000 H

LXI SP, 4000 H

PUSH H

PUSH D

CALL 3050 H

POP H

HLT

After execution of HLT instruction, the program counter and stack pointer contains respectively

- (a) 300A H, 3FFC H
- (b) 3009 H, 3FFC H
- (c) 300A H, 3FFE H
- (d) 3009 H, 3FFE H

**Q.7** The content of stack pointer and accumulator after the execution of program are respectively

```
9000 H : LXI SP, FF00H
9003 H : LXI H, 9009H
9006 H : PCHL
9007 H : MVI B, 66H
9009 H : CALL R1
900C H: JMP QUIT
```

R1: 900F H : XRA A  
9010 H : RP  
QUIT : 9011 H : HLT

- (a) FF00 H, 00 H
- (b) FEFE H, 0C H
- (c) FEFF H, 90 H
- (d) FE01 H, 66 H

**Q.8** Which one of the following 8085 microprocessor programs correctly calculates the product of two 8-bit numbers stored in registers B and C?

(a) MVI A, 00 H  
JNZ LOOP  
CMP C  
LOOP DCR B  
HLT

(b) MVI, A, 00H  
CMP C  
LOOP DCR B  
HLT

(c) MVI A, 00H  
LOOP ADD C  
DCR B  
JNZ LOOP  
HLT

(d) MVI A, 00H  
ADD C  
JNZ LOOP  
LOOP INR B  
HLT

**Q.9** Consider the following assembly language program in INTEL 8085.

```
MVI B, XX H
L2 : DCR B
JNZ L2
HLT
```

Find 'XX' if  $f_{CLK} = 5$  MHz and total execution time of program is 500  $\mu$ s.

- (a) B9 H
- (b) B2 H
- (c) 32 H
- (d) A6 H

**Q.10** Consider the following assembly language program in INTEL 8085, if  $z = 0$ ; given

```
LXI B, 0004 H
L2 : DCX B
JNZ L2
HLT
```

How many times the loop L2 is executed ?

- (a) Zero
- (b) 1
- (c) 4
- (d) Infinite

**Q.11** Consider the assembly language program given below

```
(1) MVI A, 8F H
(2) SUI CA H
(3) JC DISPLAY
(4) OUT PORT1
(5) HLT
(6) DISPLAY XRA A
(7) OUT PORT1
(8) HLT
```

If the above program is executed in 8085 then data displayed at PORT 1 and content of flag register is respectively.

- (a) 00 H, 95 H
- (b) C5 H, 95 H
- (c) C5 H, 94 H
- (d) 00 H, 44 H

**Q.12** Match List-I (Instruction) with List-II (Application) and select the correct answer using the code given below :

List-I	List-II
A. SIM	1. 16-bit addition
B. DAD	2. Initializing the stack pointer
C. DAA	3. Serial output data
D. SPHL	4. Checking the current interrupt mask setting
	5. BCD addition

Codes :

	A	B	C	D
(a)	5	4	2	1
(b)	4	1	5	2
(c)	5	1	2	4
(d)	3	4	5	1



### Numerical Data Type Questions

**Q.13** LXI H, 9876 H

SHLD 5000 H

MOV A, M

STA 4000 H

HLT

Length of the program is \_\_\_\_\_ bytes.

**Q.14** Consider the following assembly language program in INTEL 8085.

```
XRA A
LXI B, 000F H
LOOP DCX B
ANI FF H
JC LOOP
HLT
```

While execution of above program the loop will be executed \_\_\_\_\_ times.

**Q.15** Consider the following assembly language program in INTEL 8085.

```
MVI C, 00 H
L3 : DCR C
JNZ L3
HLT
```

How many times the instructions DCR C is executed \_\_\_\_\_.

**Q.16** Consider the following assembly language program in INTEL 8085.

```
MVI A, 1C H
ORA A
L1 : RAL
JNC L1
HLT
```

$f_{CLK} = 2$  MHz, then time for which loop executes is \_\_\_\_\_  $\mu$ sec.

**Q.17** Consider the assembly language program given below.

MVI A, 84 H

MVI B, AB H

SUB B

MOV D, A

HLT

If 8085 is operating at a frequency of 3 MHz then total time required to execute the above program \_\_\_\_\_  $\mu$ sec.

**Q.18** Consider the program given below for INTEL 8085

```
MVI C, 0B H
LXI H, 2400 H
LXI D, 3400 H
LOOP MOV A, M
STAX D
INR L
INR E
DCR C
JNZ LOOP
HLT
```

The total number of memory accesses required are \_\_\_\_\_.

**Q.19** Consider the following 8085 microprocessor assembly language program.

1. LXI SP, 0200 H
2. LXI B, 1028 H
3. LXI H, 42FF H
4. PUSH H
5. LXI D, 20FE H
6. DAD B
7. XCHG
8. DADD
9. HLT

After execution of above program content of HL register pair is \_\_\_\_\_ hex.



### Conventional Questions

**Q.20** Write an assembly language program to transfers 5 bytes of data from location 5000 H to 9000 H in INTEL 8085.

**Q.21** Write an assembly language program to find number of even and odd number from  $n$  bytes of data. Store the count of even numbers in  $B$  and odd numbers in  $C$ .

**Q.22** Write an ALP to find smallest number from 10 bytes of data.

**Q.23** Write an assembly language program to generate a delay of 100 msec in INTEL 8085.



**T1.** Consider the following assembly language program

```
XRA A
MVI A, 50 H
MVI B, 0F H
LOOP DCR A
JNZ LOOP
INR B
JC LOOP
HLT
```

The program is executed in INTEL 8085, find the number of times INR B executed.

**[Ans: 1]**

**T2.** Consider the following 8085 microprocessor program

```
MVI C, FF H
MVI B, FF H
L1 : DCR C
JNZ L1
DCR B
JNZ L1
HLT
```

How many times DCR C instruction executes?

**[Ans: 65,279]**

**T3.** Consider the following instructions executed in 8086

```
PUSH AX; AX has 0020H in it
PUSH BX; BX has 1234H in it
POP AX;
ADD AX, BX;
POP CX
```

Find the content of CX register after execution.

**[Ans: 20 H]**

