**Microprocessing System Tutorial Multiple Choice Question**

1. Is the following instruction correct LDI R18,50?

a) Yes

b) No

c) Cant be said

d) None of the mentioned

2. To use the PORTB for data input or output we use following registers:

a) DDRA, PORTA,PINA

b) DDRB, PORTB,PINB

c) DDRC, PORTC,PINC

d) DDRD, PORTD,PIND

3. When AVR wakes up, then the value of PC becomes?

a) 00H

b) 000H

c) 0000H

d) 00000H

4. Which of the following is correct about BREQ instruction in avr microcontrollers?

a) it is used to compare two registers

b) it is used to compare two values

c) it is used to jump to the given mentioned label when the zero flag accounts to 0

d) it is used to jump to the given mentioned label when the zero flag accounts to 0

5. Which of the following is correct about CP R1,R2 instruction in avr microcontrollers?

a) it is used to compare two registers R1 and R2 without alter value of R1 and R2

b) it is used to add two values

c) it is used to subtract R1 with R2 and store result back to R1

d) it is used to jump to the given mentioned label when the zero flag accounts to 1

6. How many times is this loop going to get executed?

LDI R20, 10

LDI R21, 70

now: DEC R21

BRNE now

OUT PORTB, R20

a) 10

b) 70

c) 700

d) none of the mentioned

7. Which of the following is used to represent the last RAM address?

a) MEM

b) LASTRAM

c) RAMEND

d) None of the mentioned

8. Which of the following is used to represent the last Flash Program address?

a) MEM

b) LASTRAM

c) RAMEND

d) F\_END

9. Show the status of the C, H, and Z flags after the subtraction of 0x9C from 0x9C in the following instructions:

LDI R20, 0x9C

LDI R21, 0x9C

SUB R20, R21

1. C=1,Z=1,H=1
2. C=0,Z=1,H=0
3. C=0,Z=0,H=1
4. C=1,Z=0,H=1

10. In AVR, which registers are there for the I/O programming of ports?

a) PORT

b) PIN

c) DDR

d) All of the mentioned

11. The data will not go from the port registers to the pin unless:

a) DDR register of that port is set to 0

b) PORT register of that port is set to 1

c) DDR register of that port is set to 1

d) PORT register of that port is set to 0

12. Which of the following statements are correct?

a) PIN register of a port is used to bring data into CPU from pins

b) PORT register is used to send data out to pins

c) DDR register is used to control the direction of a port

d) All of the mentioned

13. Which of the following is correct about the SBIS instruction?

a) it is used to the monitor the status of the HIGH for the single bit of a port

b) it is a byte oriented instruction

c) It is a 4 byte instruction

d) all of the mentioned

14. Instruction CBI PORTB,0 means

a) clearing the PORTB register

b) clearing the first bit of the PORTB register

c) setting the PORTB register

d) setting the first bit of the PORTB register

15. What is the main function of the SBIC instruction?

a) it is used to clear a particular bit of a port

b) it is used to jump unconditionally

c) it is used to skip the next instruction if a particular bit of a port is zero

d) none of the mentioned

16. In executing subtraction based instructions, state the role of the C flag?

a) if C=1, the result is negative

b) if C=1, the result is positive

c) none of the mentioned

d) all of the mentioned

17. What is right about the ROR instruction?

a) it rotates the contents of the register left to right

b) it rotates the contents of the register from right to left

c) it rotates the contents of the register from left to right through carry

d) it rotates the contents of the register from right to left through carry

18. Show the status of the C,H, Z flags after the addition of 0x88 and 0x93 in the following instructions

LDI R16,0x88

LDI R19,0x93

ADD R16,R19

a) C=0, H=0, Z=0

b) C=0, H=1, Z=0

c) C=1, H=0, Z=0

d) C=0, H=1, Z=1

19. What is the value of R20 after running following assembly program

.CSEG

.ORG 000

SER R20

DEC R20

DEC R20

COM R20

HERE: JMP HERE

1. R20=0x0D
2. R20=0xFE
3. R20=0xFF
4. R20=0x02

20. What is the value of R22 after running following assembly program

.CSEG

.ORG 000

CLR R22

INC R22

LDI R16,0x05

ADD R22,R16

NEG R22

HERE: JMP HERE

1. R22=0x00
2. R22=0xFA
3. R22=0x05
4. R22=0x02

21. What is the value of R22 after running following assembly program

.CSEG

.ORG 0x000

ldi r17, 103 .

ori r17, 0b00110101

subi r17, 0x76

cpi r17, 0xff

andi r17, 0x65

HERE: JMP HERE

1. R22=0x00
2. R22=0x76
3. R22=0x01
4. R22=0x65

22. What is the value of R20,R21, R22 after running following assembly program

.include “M32DEF.INC”

.def A = R20

.def B = R21

.def C = R22

LDI A,0x09

LDI B,0x25

MOV C, A ;

CP C, B ;

BRSH Label2;

MOV C, B

Label2: Jmp Label2

1. R20=0x09, R21=0x25, R22=0x09
2. R20=0x09, R21=0x25, R22=0x25
3. R20=09, R21=25, R22=25
4. R20=0x09, R21=0x25, R22=0x00

23. What are the value of R22,R23,R24 and output of PORTD when we finish running this program.

.include "M32DEF.INC"

.EQU val1 =0x11

.EQU val2 =0x22

.EQU val3 =0x33

.def var\_A = R22

.def var\_B = R23

.def var\_C = R24

.def Result = R19

LDI R20,0xFF

OUT DDRD,R20

LDI var\_A,val1

LDI var\_B,val2

LDI var\_C,val3

LDI Result,0x00

ADD Result, var\_A

ADC Result, var\_B

ADC Result, var\_C

OUT PORTD, Result

Label: Jmp Label

1. R22=0x11, R23=0x22, R24=0x33, PORTD=0x66
2. R22=0x11, R23=0x22, R24=0x33, PORTD=0x11
3. R22=0x11, R23=0x22, R24=0x33, PORTD=0x22
4. R22=0x11, R23=0x22, R24=0x33, PORTD=0x33

24. What are the value of R16 when when we finish running this program ?

.INCLUDE <m32def.inc>

.DSEG

.ORG 0x0065

A: .BYTE 1

.ORG 0x0067

B: .BYTE 1

.ORG 0x006B

C: .BYTE 1 ;

.CSEG

.ORG 000

LDI R16, 0x44

STS A, R16

LDI R16, 0x33

STS B, R16

LDS R1, A

LDS R2, B

ADD R1, R2

STS C, R1

LDS R16, C

HERE : JMP HERE

1. R16=0x00
2. R16=0x22
3. R16=0x55
4. R16=0x77

25. What are the value of R5 and R6 when we finish running this program ?

.INCLUDE <m32def.inc>

.dseg

dif\_var: .byte 2

.CSEG

.ORG 000

ldi ZL, low(Num16\_1<<1)

ldi ZH, high(Num16\_1<<1)

lpm R1,Z+

lpm R2,Z+

lpm R3,Z+

lpm R4,Z+

sub R1,R3

sbc R2,R4

sts dif\_var, R1

sts dif\_var+1, R2

lds R5,dif\_var

lds R6,dif\_var+1

Here : jmp Here

Num16\_1: .dw 0x3344

Num16\_2: .dw 0x1122

1. R5=0x00, R6=00
2. R5=0x33, R6=33
3. R5=0x11, R6=22
4. R5=0x22, R6=22

26. What are the value of PORTB when we finish running this program ?

.include "M32DEF.INC"

.def A = R18

.def B = R19

.def C = R20

.def D = R21

.EQU OUT\_DIRECTION = 0xFF

.EQU FIX\_COUNT = 0x11

.SET COUNT = 0x22

LDI R16,OUT\_DIRECTION

OUT DDRB, R16

LDI A, COUNT

LDI B, COUNT + 9

.SET COUNT = 0x33

LDI C, COUNT

LDI D,FIX\_COUNT

ADD D,A

ADC D,B

ADC D,C

OUT PORTB,D

HERE: JMP HERE

1. PORTD=0x95
2. PORTD=0x11
3. PORTD=0x33
4. PORTD=0x91

27. What is the outputs of PORTB and PORTC when we finish running this program ?

|  |  |
| --- | --- |
| .include "m32def.inc"  .ORG $0  .EQU FIND\_VALUE = 'b'  .MACRO IO\_CONFIG  LDI R20,@1  OUT @0,R20  .ENDMACRO  IO\_CONFIG DDRB,0XFF  IO\_CONFIG DDRC,0XFF  LDI ZH,HIGH(TABLE<<1)  LDI ZL,LOW(TABLE<<1)  LDI R16,0  LDI R18,FIND\_VALUE  LDI R17,0 | LOOP:  LPM R17, Z+  CPI R17, '.'  BREQ HERE  CP R17, R18  BREQ RUN  INC R16  RJMP LOOP  RUN:  OUT PORTB, R16  OUT PORTC, R17  HERE: RJMP HERE  .ORG $500  TABLE: .DB 0,1,2,3,'a',5, 'b',7, 'c',9, '.' |

1. PORTB=0x01, PORTC='a'
2. PORTB=0x06, PORTC='b'
3. PORTB=0x07, PORTC='a'
4. PORTB=0x08, PORTC='c'

28. What is the output of PORTC when we finish running this program ?

.include "M32DEF.INC"

.CSEG

.ORG 0x0000

LDI R16,0xFF

OUT DDRC, R16

OUT DDRB,R16

SBI PORTB,3

CHECKBIT: SBIS PORTB,3

JMP OVER

LDI R16, 0x01

OUT PORTC, R16

JMP END

OVER :

LDI R16, 0x02

OUT PORTC, R16

END: JMP END

1. PORTC=0x01
2. PORTC=0xFF
3. PORTC=0x00
4. PORTC=0x02

29. What is the outputs of PORTD when we finish running this program ?

.include "M32DEF.INC"

.EQU NUM1 = 0x55

.EQU NUM2 = 0xAA

.org 0

LDI R16, 0xFF

OUT DDRB, R16 ;

SBI PORTB,2 ;

SBI PORTB,3 ;

LDI R16, 0xFF

OUT DDRD, R16 ;

AGAIN: SBIC PORTB,2 ;

RJMP OVER ;

RJMP OTHER;

OVER: SBIS PORTB,3 ;

RJMP OTHER ;

LDI R16, NUM1

OUT PORTD,R16 ;

RJMP END

OTHER:

LDI R16, NUM2

OUT PORTD,R16 ;

END: RJMP END

1. PORTD=0x00
2. PORTD=0xFF
3. PORTD=0x55
4. PORTD=0xAA

30. After completion of execution of the following program, what is the content of PORTD ?:

.INCLUDE "m32def.inc"

.DSEG

.ORG 0x0600

Sum: .BYTE 1

.CSEG

.ORG 0x0500

myString: .DB 0x33, 0x2C, 0x63, 0x58, 0x50, 0x09,0xA5,0xA6,0xC9,0xF6

.ORG 0x0000

SER R16

OUT DDRD, R16

LDI ZL, LOW(myString <<1)

LDI ZH, HIGH(myString <<1)

LDI R17, 9

LDI R16,0x33

LOOP: LPM R18, Z+

CP R16, R18

BRCC NEXT

MOV R16,R18

NEXT:

DEC R17

BRNE LOOP

OUT PORTD,R16

END: RJMP END

1. PORTD=0x00
2. PORTD=0xFF
3. PORTD=0x09
4. PORTD=0xC9