

0000h	2Ah
0001h	00h
0002h	50h
0003h	10h
0004h	00h
0005h	FFh
0006h	52h
0007h	02h
0008h	03h
0009h	03h
000Ah	B0h
000Bh	00h
000Ch	52h
000Dh	0Eh
.....	
0050h	FFh
0051h	AAh
0052h	00h
0053h	50h
.....	

Başlangıçta PC'ye 0000h değerinin atandığını düşünerek bellekteki program işletilecektir. (Not:Komutların opcode'ları aşağıdaki tabloda verilmiştir.)

**Soru 1:** Program bitiminde Aküdeki (AC) bilgi ne olacaktır?

a) 00A9h b) 00AAh c) 00ABh d) 00ACH

**Soru 2:** Program bitiminde, aküdeki bilgi hangi bellek adresinden itibaren saklanacaktır?

a) 0053h b) 0052h c) 0051h d) 0050h

**Soru 3:** Bellekteki program kaç komuttan oluşmaktadır?

a) 5 b) 8 c) 7 d) 6

**Soru 4:** Program tamamlandığında TR'nin (Temporary Register) içeriği ne olur?

a) 0050h b) 0051h c) 0052h d) 0053h

Komut	Açıklama	Adresleme Modu					
		Doğal	İvedi	Direkt	Dolaylı	İndis	Göreceli
ADD	$AC \leftarrow AC + DR$ (AC ve DR işaretsiz)	-	10h	20h	30h	40h	-
LDA	Aküye yükle	-	1Ah	2Ah	3Ah	4Ah	-
STA	Aküden belleğe yaz	-	-	A0h	B0h	C0h	-
INCR	Arttır	03H	-	-	-	-	-
BCS	$C=1$ ise dallan	-	-	-	-	-	52h
HLT	Dur	0Eh	-	-	-	-	-

**SP başlangıçta 0100h değerini göstermektedir.**

LDA #1234h  
PSH  
AND #37FCh  
PSH  
ADD #0008h  
PUL  
HLT

**Soru 5:** Program işletildiğinde aküdeki (AC) değer ne olacaktır?

a) 123Ch b) 37FCh c) 37F4h d) 1234h

**Soru 6:** Program bitiminde, Yığın Kaydedicisi (SP) hangi bellek gözünü gösterir?

a) 0102h b) 0104h c) 00FEh d) 00FCh

**Soru 7:** 8 kaydediciyi 8 bitlik bir veriyoluna bağlayabilmek için kaç tane MUX kullanılmalıdır?

a) 2 b) 3 c) 4 d) 8

**Soru 8:** 8 kaydediciyi 8 bitlik bir veriyoluna tristate kullanarak bağlayabilmek için ne tip bir decoder kullanmak gerekir?

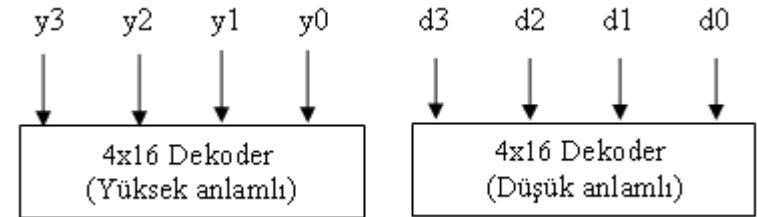
a)  $2 \times 4$  b)  $3 \times 8$  c)  $4 \times 16$  d)  $8 \times 256$

**Soru 9:** Temel bilgisayar sistemimizde, bir komut bağıl (göreceli) adresleme modunu kullanmaktadır. Bu komut belleğin 0123h adresinden itibaren yerleştirildiyse ve ofset kısmı da F5h değerini içeriyorsa, etkin adres ne olur?

a) 0218h b) 011Ah c) F11Ah d) F21Ah

KOMUTUN MİKRO İŞLEM ADIMLARI	
T0	$AR \leftarrow PC$
T1	$IR \leftarrow M[AR], PC \leftarrow PC+1$
$a = T2 * ADRMD0'$	$AR \leftarrow PC, PC \leftarrow PC+1$ , komudu çöz
$b = T3 * IDEC17 * ADRMD4$	$AR \leftarrow$ Etkin Adres
$c = T4 * IDEC17 * ADRMD4$	$IX_H \leftarrow M[AR], AR \leftarrow AR+1$
$d = T5 * IDEC17 * ADRMD4$	$IX_L \leftarrow M[AR], SC \leftarrow 0$

Veri Yolunu Kullanacak Eleman	Kod Çözücü Girişi
PC	0011
AR	1000
M	1001
IX	0110
Etkin Adres	1010



Temel bilgisayarsistemimizde yer alan bir komutun mikroişlem adımları yukarıdaki gibidir. Buna göre aşağıdaki soruları cevaplayınız.

**Soru 10:** Bu komutun execute saykılında dekodelelerin girişlerine uygulanacak kontrol sinyallerini bulunuz?

a)  $y3-y2-y1-y0 = (b+c) - 0 - b - c$ ;  $d3-d2-d1-d0 = (b+d) - 0 - b - d$

b)  $y3-y2-y1-y0 = c - 0 - (a+b+c) - (c+a)$ ;  $d3-d2-d1-d0 = (b+d) - c - (a+b+c) - (a+c+d)$

c)  $y3-y2-y1-y0 = (b+c) - 0 - (b+c) - (c+a)$ ;  $d3-d2-d1-d0 = (a+b+d) - 0 - b - (a+d)$

d)  $y3-y2-y1-y0 = (b+c) - 0 - b - (c+d)$ ;  $d3-d2-d1-d0 = (b+c+d) - 0 - b - (b+d)$

**Soru 11:** Tüm mikroişlem adımları boyunca, AR'nin Load (LD) girişine uygulanacak olan kontrol sinyalleri ne olmalıdır?

a)  $T1+c+d$  b)  $T0+T1+a+b+c$  c)  $T0+a+b$  d)  $T0+a+b+c$

**Soru 12:** Bu komutun, 8 bitlik olan OPCODE'unu tablodaki bilgiler ışığında bulunuz?

a) 17h b) 11h c) C1h d) 21h

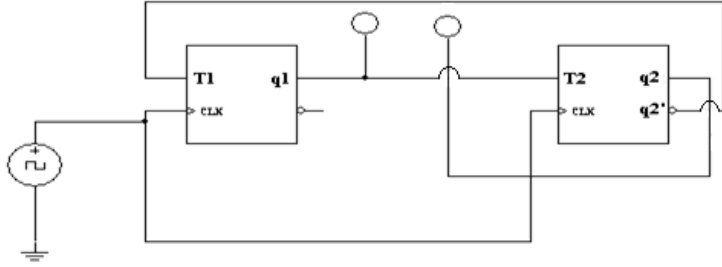
**Soru 13:** Bu komut bellekte kaç byte yer kaplar?

a) 1 b) 2 c) 3 d) 4

**Soru 14:** D tipi flip floplardan oluşan 2 bitlik bir kaydediciye ( $q_1q_0$ ) Clear özeliği eklemek istersek, flip flopların uyarma işlevleri ne olur?

- a)  $D_1=q_1 \cdot \text{Clear}'$ ,  $D_0=q_0 \cdot \text{Clear}'$   
b)  $D_1=q_0 \cdot \text{Clear}$ ,  $D_0=q_1 \cdot \text{Clear}$   
c)  $D_1=D_0=q_1 \cdot q_0 \cdot \text{Clear}'$   
d)  $D_1=D_0=q_1 \cdot q_0 \cdot \text{Clear}$

**Soru 15:** Aşağıdaki şekilde 2 adet T tipi flip-flop'tan oluşmuş bir ardışıl devre görülmektedir. Flip-flop'ların çıkışlarına da iki adet LED bağlanmıştır. Sistemin  $q_1q_2=11$  durumundan başlaması halinde clock saykılıyla nasıl bir çıkış üretilir?



- a)  $q_1q_2 = 11 \rightarrow 00 \rightarrow 01 \rightarrow 10$   
b)  $q_1q_2 = 11 \rightarrow 01 \rightarrow 10$   
c)  $q_1q_2 = 11 \rightarrow 10 \rightarrow 01 \rightarrow 00$   
d)  $q_1q_2 = 11 \rightarrow 10 \rightarrow 01$

Assembly dilinde verilen aşağıdaki programı belleğin 0000h numaralı gözünden itibaren yerleştirirsek ve PC'ye de 0000h değerini atadığımızı düşünürsek,

LDA #1234h	0000h
BSR ~05h	
INCR	
HLT	
INCR	
RTS	
DECR	
RTS	
	...

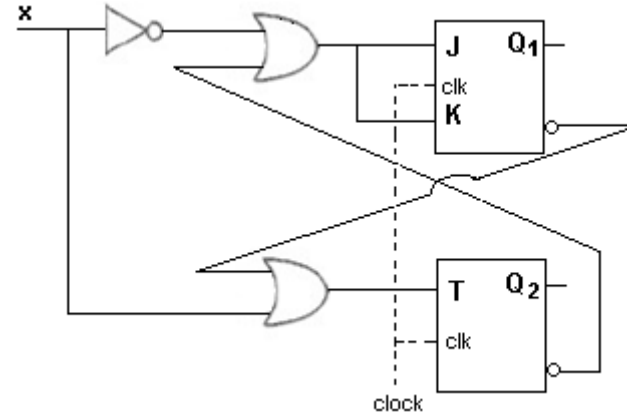
Komut	Açıklama
LDA #	İvedi modda Aküye yükle
BSR ~	Göreceli mod ile altprograma dallan
INCR	Aküyü 1 arttır
DECR	Aküyü 1 azalt
HLT	Programı durdur
RTS	Altprogramdan geri dön

**Soru 16:** Program işletildiğinde aküdeki (AC) değer ne olur?

- a) 1233h b) 1234h c) 1235h d) 1236h

**Soru 17:** BSR ~05h komutu işletilirken Stack'e kaydedilen bilgi nedir?

- a) 0004h b) 0005h c) 0006h d) 0007h



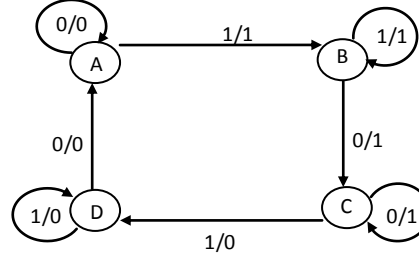
**Soru 18:** Yukarıdaki ardışıl devre  $x = 0$  için  $Q_1Q_2$  çıkışlarında nasıl bir tekrarlı çıkış üretir? (Başlangıçta  $Q_1Q_2 = 11$  dir.)

- a)  $Q_1Q_2 = 11 \rightarrow 10 \rightarrow 01 \rightarrow 00 \dots$  b)  $Q_1Q_2 = 11 \rightarrow 01 \rightarrow 10 \rightarrow 00 \dots$   
c)  $Q_1Q_2 = 11 \rightarrow 00 \rightarrow 10 \rightarrow 01 \dots$  d)  $Q_1Q_2 = 11 \rightarrow 01 \rightarrow 00 \rightarrow 10 \dots$

**Soru 19:** Yukarıdaki ardışıl devre  $x = 1$  için  $Q_1Q_2$  çıkışlarında nasıl bir tekrarlı çıkış üretir? (Başlangıçta  $Q_1Q_2 = 11$  dir.)

- a)  $Q_1Q_2 = 11 \rightarrow 01 \rightarrow 00 \rightarrow 10 \dots$  b)  $Q_1Q_2 = 11 \rightarrow 01 \rightarrow 10 \rightarrow 00 \dots$   
c)  $Q_1Q_2 = 11 \rightarrow 00 \rightarrow 10 \rightarrow 01 \dots$  d)  $Q_1Q_2 = 11 \rightarrow 10 \rightarrow 01 \rightarrow 00 \dots$

**Soru 20:** Aşağıdaki durum diyagramı hangi işlevi yerine getirmektedir?



- a) Girişin 1'den 0'a geçişiyle, çıkış 2 clock saykılı 1 olur.  
b) Girişin 1'den 0'a geçişiyle çıkışı tersler.  
c) Girişin 0'dan 1'e geçişiyle çıkışı tersler.  
d) Girişin 0'dan 1'e geçişiyle, çıkış 2 clock saykılı 1 olur.

A	a	b	c	d	a	b	c	d
1	○	○	○	○	11	○	○	○
2	○	○	○	○	12	○	○	○
3	○	○	○	○	13	○	○	○
4	○	○	○	○	14	○	○	○
5	○	○	○	○	15	○	○	○
6	○	○	○	○	16	○	○	○
7	○	○	○	○	17	○	○	○
8	○	○	○	○	18	○	○	○
9	○	○	○	○	19	○	○	○
10	○	○	○	○	20	○	○	○

İsim:

Numara:

İmza:

Grubu:

- 1.Öğr. ○ A ○  
2.Öğr. ○ B ○  
Karma ○ C ○

A

	a	b	c	d
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B

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