(CRN: 15445) BLG 231 - Final Sınavı

05/02/2021
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Soru 1

a) $(B5F)_{16}$ → $= (1011\ 0101\ 1111)_2$

B=11 F=15

$= (101101011111)_2$

$= (15 \times 16^0) + (5 \times 16^1) + (11 \times 16^2)$

$= (15 + 80 + 2816)_{10} = (2911)_{10}$

b)

```
    1001001
 x      101
 ----------
    1001001
   0000000
+ 1001001
 ----------
 (101101101)_2
```

$(1001001)_2 \times (101)_2 = (101101101)_2$

$= (555)_8$

c) $(1000100)_2$

$(1010100)_2$ → 2'ye tümleyeni → 0101011 + 1 = 0101100

```
   (0101100)_2
+
   1110000
```

1110000 → 2'ye complement → 0001111 + 1 = 0010000 → $-(0010000)_2$

cevap negatif gelecek çünkü elde biti yok

başına "−" koyuyoruz

d) $(10110)_{10}$ − $(1111100)_{10}$

$10^7 - 1111100 - 1 = 8888900$

```
   8888900
+    10110
 ---------
   8899010
```

r-1 tümleyeni → $10^7 - 8899010 = 1.100.990$

$= -1100990$

e) $(01110011 . 00100101)_{BCD} = (73.25)_{10}$

$(73.25)_{10} = (1001001.01)_2$

73	1
36	0
18	0
9	1
4	0
2	0
1	1

$0.25 \times 2 = 0 + 0.50$

$0.50 \times 2 = 1 + 0$

Soru 2

a) $A + BC \stackrel{?}{=} (A+B).(A+C)$

Boolen dağılma kuralına göre:

$A+BC = (A+B).(A+C)$

b) $AB + \bar{A}C + BC \stackrel{?}{=} AB + \bar{A}C$

$AB + \bar{A}C + (\bar{A}+A).BC$

$AB + \bar{A}C + \bar{A}BC + ABC$

$AB(\underbrace{1}_{1}+C) + \bar{A}C(\underbrace{1+B}_{1}) = AB + \bar{A}C$

c) $(A+B).(\bar{A}+C).(B+C) \stackrel{?}{=} (A+B).(\bar{A}+C)$

$(\underbrace{A.\bar{A}}_{0} + \bar{A}B + AC + BC).(B+C)$

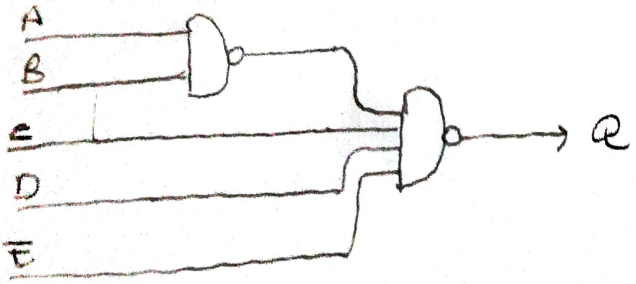
$= (\bar{A}B + ABC + BC + \bar{A}BC + AC + BC) = BC.\underbrace{(A+\bar{A})}_{1} + \bar{A}B + AC + BC$

$= \bar{A}B + AC + BC = \bar{A}B + A\bar{A} + AC + BC$

$= \bar{A}(A+B) + C.(A+B) = \boxed{(\bar{A}+C).(A+B)}$

Soru 3

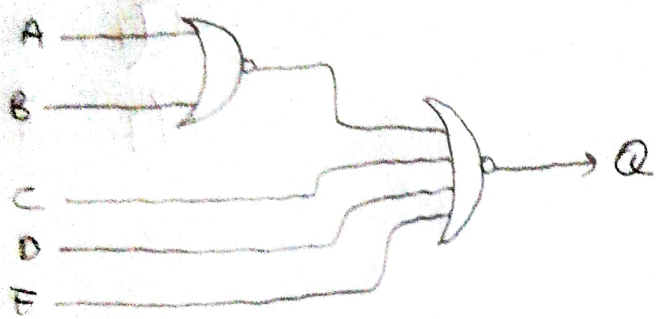
a) $Q = \overline{((\bar{A}+\bar{B}) \cdot D \cdot \bar{E})} = \overline{(\overline{A.B}).C.D.E}$



Soru 3

b) $Q = \overline{((\bar{A}.\bar{B}) + (C+D+E))}$ Veyo değil ile

$= \overline{(\bar{A}.\bar{B})} + C + D + E$



Soru 4 $Q(A,B,C) = \bar{A}\bar{B}C + \bar{A}BC + AB\bar{C} + ABC$

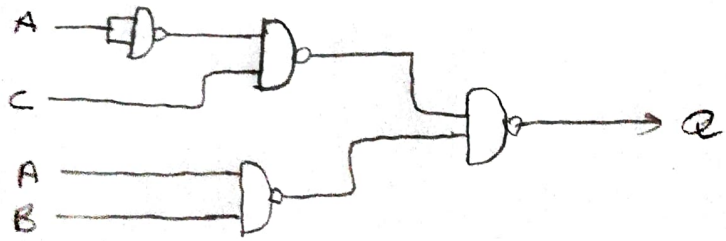
C \ AB	00	01	11	10
0	0	0	1	0
1	1	1	1	0

Mintermler ile ;

$Q = \bar{A}C + AB$

Ve değil ile

$\overline{(\bar{A}C + AB)} = \overline{(\overline{\bar{A}C}) \cdot (\overline{AB})}$

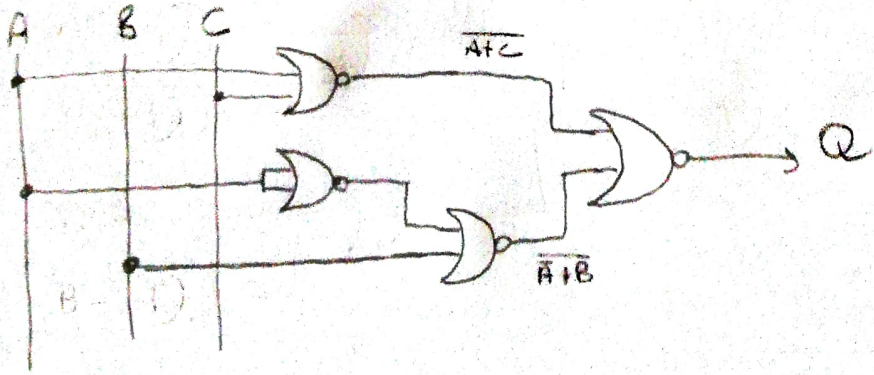


Mak term ile ;

C \ AB	00	01	11	10
0	0	0	1	0
1	1	1	1	0

$Q = (A+C) \cdot (\bar{A}+B)$

Veyo değil ile → $\overline{(\overline{(A+C)} + \overline{(\bar{A}+B)})}$

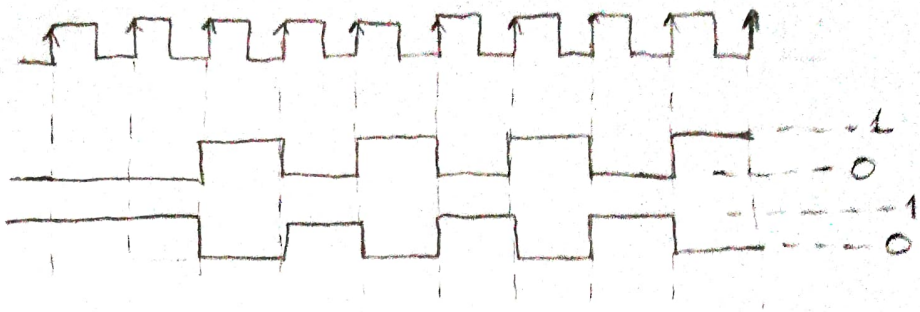


Soru 5

Doğruluk tablosu:

Clock	S	R	Q_+	$\bar{Q}_+$
↑	0	0	Q	$\bar{Q}$
↑	0	1	0	1
↑	1	0	1	0
↑	1	1	x	x

* S=1 , R=1 durumu kullanılmaz.



Soru 6

Doğruluk Tablosu

Clck	J	K	Q_+	$\bar{Q}_+$
↑	0	0	Q	$\bar{Q}$
↑	0	1	0	1
↑	1	0	1	0
↑	1	1	$\bar{Q}$	Q