



## MUAMMOLI MASALA VA TOPSHIRIQLAR:

1. Quyidagi bul funksiyalari uchun qiymatlar jadvalini tuzing:

- 1)  $f(x, y, z) = ((x \rightarrow z) y') \rightarrow x'$ ;
- 2)  $f(x, y, z) = ((x \vee y') \rightarrow z) ((x|y) \leftrightarrow z')$ ;
- 3)  $f(x, y, z) = x' \rightarrow (x \leftrightarrow (y + (xz)))$ ;
- 4)  $f(x, y, z) = (((x/y) \downarrow z) | y) \downarrow z$ ;
- 5)  $f(x, y, z) = ((x \rightarrow (y \vee z)) (yz)') \rightarrow x$ .

**Yechim: 5)**  $f(x, y, z) = ((x \rightarrow (y \vee z)) (yz)') \rightarrow x$  bul funksiyasi uchun qiymatlar jadvalini tuzamiz: a)  $x \rightarrow (y \vee z)$ , b)  $(x \rightarrow (y \vee z)) (yz)'$  deb belgilaymiz.

$x$	$y$	$z$	$y \vee z$	$a$	$yz$	$(yz)'$	$b$	$f$
0	0	0	0	1	0	1	1	1
0	0	1	1	1	0	1	1	1
0	1	0	1	1	0	1	1	1
0	1	1	1	1	1	0	0	0
1	0	0	0	0	0	1	0	0
1	0	1	1	1	0	1	1	0
1	1	0	1	1	0	1	1	0
1	1	1	1	1	1	0	0	0

2. Tegishli qiymatlar jadvalini tuzib, bul funksiyalarining teng yoki teng emasligini tekshiring:

- 1)  $f(x, y, z) = ((x \vee y) \vee z) \rightarrow ((x \vee y)(x \vee z))$ ,  $g(x, y, z) = x \vee (y \leftrightarrow z)$ ;
- 2)  $f(x, y, z) = (x' \vee y)(y \vee z)$ ,  $g(x, y, z) = (x \vee y \vee z)(x' \vee y \vee z)(x' \vee y \vee z')$ ;
- 3)  $f(x, y, z) = (x \rightarrow y) \rightarrow z$ ,  $g(x, y, z) = x \rightarrow (y \rightarrow z)$ ;
- 4)  $f(x, y) = ((x + y) \rightarrow (x \vee y))((x' \rightarrow y) \rightarrow (x + y))$ ,  $g(x, y) = x/y$ ;
- 5)  $f(x, y, z) = (x + y)' \vee (x + z)'$ ,  $g(x, y, z) = xyz + x'y'z$ .

**Yechim: 5)**  $f$  va  $g$  funksiyalarining qiymatlar jadvalini tuzamiz:

$$f(x, y, z) = (x + y)' \vee (x + z)'$$

$x$	$y$	$z$	$x + y$	$(x + y)'$	$x + z$	$(x + z)'$	$f(x, y, z)$
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0	0	0	0	1	0	1	1
0	0	1	0	1	1	0	1
0	1	0	1	0	0	1	1
0	1	1	1	0	1	0	0
1	0	0	1	0	1	0	0
1	0	1	1	0	0	1	1
1	1	0	0	1	1	0	1
1	1	1	0	1	0	1	1

$$g(x,y,z)=xyz+x'y'z'$$

$x$	$y$	$z$	$xy$	$xyz$	$x'$	$y'$	$z'$	$x'y'$	$x'y'z'$	$g(x,y,z)$
0	0	0	0	0	1	1	1	1	1	1
0	0	1	0	0	1	1	0	0	0	0
0	1	0	0	0	1	0	1	0	0	0
0	1	1	0	0	1	0	0	0	0	0
1	0	0	0	0	0	1	1	0	0	0
1	0	1	0	0	0	1	0	0	0	0
1	1	0	1	0	0	0	1	0	0	0
1	1	1	1	1	0	0	0	0	0	1

$f(0,0,1) \neq g(0,0,1)$ ,  $f(0,1,0) \neq g(0,1,0)$ ,  $f(1,0,1) \neq g(1,0,1)$ ,  
 $f(1,1,0) \neq g(1,1,0)$ . Demak,  $f(x,y,z) \neq g(x,y,z)$ .

**3.** Amallarni kon'yunksiya ( $\cdot$ ) va inkor ( $'$ ) amallari yordamida ifodalang:

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|---|-------------------------------------|
| 1) diz'yunksiya ( $\vee$ );             | 2) implikasiya ( $\rightarrow$ );   |
| 3) ekvivalentlik ( $\leftrightarrow$ ); | 4) Jegalkin yig'ndisi (+);          |
| 5) Sheffer shtrixi ( $ $ );             | 6) Pirs strelrasi ( $\downarrow$ ); |