MUAMMOLI MASALA VA TOPSHIRIQLAR:

1. Quyidagi bul funksiyalari uchun qiymatlar jadvalini tuzing:

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

Yechim: 5) $f(x,y,z)=((x\to(y\vee z))((yz)')\to x$ bul funksiyasi uchun qiymatlar jadvalini tuzamiz: $a)\ x\to(y\vee z),\ b)\ (x\to(y\vee z))(yz)'$ 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) $f(x,y,z)=((x\vee y)\vee z)\to((x\vee y)(x\vee z)),\quad g(x,y,z)=x\vee(y\leftrightarrow z);$
2) $f(x,y,z)=(x'\vee y)(y\vee z),\quad g(x,y,z)=(x\vee y\vee z)(x'\vee y\vee z)(x'\vee y\vee z');$
3) $f(x,y,z)=(x\to y)\to z),\quad g(x,y,z)=x\to(y\to z);$
4) $f(x,y)=((x+y)\to(x\vee y))((x'\to y)\to(x+y)),\quad g(x,y)=x|y;$
5) $f(x,y,z)=(x+y)'\vee(x+z)',\quad g(x,y,z)=xyz+x'y'z.$

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

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

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

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:

1) diz'yunksiya ($\vee$); 2) implikasiya ($\rightarrow$);

3) ekvivalentlik ($\leftrightarrow$); 4) Jegalkin yig'ndisi ($+$) ;

5) Sheffer shtrixi ($|$) ; 6) Pirs strelrasi ($\downarrow$);