Задание на контрольную работу №5

Построить АВМ на ОУ для реализации заданной арифметической формулы. Упрощение формулы путем выполнения математических операций (раскрытие скобок, приведение к общему множителю и т.д.) не допускается. Номер варианта совпадает с номером формулы. Значения для входных воздействий (переменные x, y, и z) приведены в соответствующих таблицах. АВМ реализуется в системе LtSpice IV или в любой другой системе схемотехнического моделирования. Проверкой служит сопоставление графика выходного напряжения полученного в LtSpice IV с графиком, соответствующим заданной формуле. Для питания схемы используется только один источник постоянного напряжения $E_П$, значение которого должно учитываться при выборе ОУ (напряжение питания необходимое для работы конкретной модели ОУ можно узнать из технической документации представленной, например, на сайте изготовителя).

1) $U_{out}=\frac{x}{5}+3(5y+4z)$

2) $U_{out}=\frac{8x-2.1z}{15}-\frac{y}{4}$

3) $U_{out}=\frac{2x+2y-2z}{5}$

4) $U_{out}=4(x+5y)-8z$

5) $U_{out}=\frac{5+2(3x-5y)}{3}-4z$

6) $U_{out}=\frac{5x+0.5y+9z}{6}-2$

7) $U_{out}=\frac{2+x}{5}-5y-1.4z$

8) $U_{out}=\frac{3.1x-5.2y-12z}{80}$

9) $U_{out}=10-\frac{x+2y}{5}+3.4z$

10) $U_{out}=\frac{x}{17}+5.1y-\frac{z}{13}$

11) $U_{out}=9+\frac{3x-5}{3}-4(y+z).$

12) $U_{out}=\frac{12x+5}{0.7}+15y-\frac{19z}{3}$

13) $U_{out}=\frac{21x}{5}-\frac{5y}{3}-1.4z+2$

14) $U_{out}=8+\frac{3(5x+3y)}{3.5}+8z$

15) $U_{out}=3x-\frac{9.1x+7}{9}+3.4z$

16) $U_{out}=7+\frac{2x-2.5y}{11}+\frac{z}{14}$

17) $U_{out}=1.9x+2.3y+1.1z-2$

18) $U_{out}=\frac{x}{11}+\frac{y}{7}+\frac{z}{3}+13$

19) $U_{out}=\frac{3x+5}{11}+3y-\frac{7z+2}{7}$

20) $U_{out}=\frac{1.4(2x+5)}{11}-\frac{4y+9z}{9}$

21) $U_{out}=\frac{0.7x}{0.31}+\frac{0.5y}{0.7}-\frac{0.4z}{0.35}+3$

22) $U_{out}=7x-\frac{2+10y}{5}+\frac{15z}{16}$

23) $U_{out}=\frac{21x+5}{11}+\frac{15y}{7}+14z$

24) $U_{out}=7x+8y-\frac{5z+3.5}{1.3}$

25) $U_{out}=8+\frac{11x-17y}{5.5}+\frac{5z}{7}$

26) $U_{out}=5x+\frac{11-17y}{13}+5z$

27) $U_{out}=\frac{x}{5.9}+\frac{11y-3.7}{7.7}+9z$

28) $U_{out}=5(7x-13y)+\frac{z}{8}$

29) $U_{out}=\frac{5x+2}{7}+\frac{7y-7}{9}+\frac{3z+17}{11}$

Группа К3200				
Вар.	x	y	z	$E_П$
1	0.01sin(314t+π/3)	0.01sin1000t	0.005	9
2	0.02sin(314t+π/4)	0.02sin1100t	0.01	9.5
3	0.03sin(314t+π/5)	0.03sin1200t	0.015	10
4	0.04sin(314t+π/6)	0.04sin1300t	0.02	11.5
5	0.05sin(314t+π/7)	0.05sin1400t	0.025	12
6	0.06sin(314t+π/8)	0.06sin1500t	0.03	12.5
7	0.07sin(314t+π/9)	0.07sin1600t	0.035	13
8	0.08sin(314t+π/10)	0.08sin1700t	0.04	13.5
9	0.09sin(314t+π/11)	0.09sin1800t	0.045	14
10	0.1sin(314t+π/12)	0.1sin1900t	0.05	14.5
11	0.11sin(314t+π/2)	0.11sin2000t	0.055	15
12	0.12sin(314t+π/3)	0.12sin2100t	0.06	9
13	0.13sin(314t+π/4)	0.13sin2200t	0.065	9.5
14	0.14sin(314t+π/5)	0.14sin2300t	0.07	10
15	0.15sin(314t+π/6)	0.15sin2400t	0.075	11.5
16	0.16sin(314t+π/7)	0.16sin2500t	0.08	12
17	0.17sin(314t+π/8)	0.17sin2600t	0.085	12.5
18	0.18sin(314t+π/9)	0.18sin2700t	0.09	13
19	0.19sin(314t+π/10)	0.19sin2800t	0.095	13.5
20	0.2sin(314t+π/11)	0.20sin2900t	0.1	14
21	0.21sin(314t+π/12)	0.21sin3000t	0.105	14.5
22	0.22sin(314t+π/13)	0.22sin3100t	0.11	15
23	0.23sin(314t+π/14)	0.23sin3200t	0.115	9
24	0.24sin(314t+π/15)	0.24sin3300t	0.12	9.5
25	0.25sin(314t+π/2)	0.25sin3400t	0.125	10
26	0.26sin(314t+π/3)	0.26sin3500t	0.13	10.5
27	0.27sin(314t+π/4)	0.27sin3600t	0.135	11
28	0.28sin(314t+π/5)	0.28sin3700t	0.14	11.5
29	0.29sin(314t+π/6)	0.29sin3800t	0.145	12

Группа К3210				
Вар.	x	y	z	$E_П$
1	0.01sin(100t+π/3)	0.001	0.01sin10t	9
2	0.02sin(100t+π/4)	0.002	0.02sin11t	9.5
3	0.03sin(100t+π/5)	0.003	0.03sin12t	10
4	0.04sin(100t+π/6)	0.004	0.04sin13t	11.5
5	0.05sin(100t+π/7)	0.005	0.05sin14t	12
6	0.06sin(100t+π/8)	0.006	0.06sin15t	12.5
7	0.07sin(100t+π/9)	0.007	0.07sin16t	13
8	0.08sin(100t+π/10)	0.008	0.08sin17t	13.5
9	0.09sin(100t+π/11)	0.009	0.09sin18t	14
10	0.1sin(100t+π/12)	0.01	0.1sin19t	14.5
11	0.11sin(100t+π/2)	0.012	0.11sin20t	15
12	0.12sin(100t+π/3)	0.013	0.12sin21t	9
13	0.13sin(100t+π/4)	0.014	0.13sin22t	9.5
14	0.14sin(100t+π/5)	0.015	0.14sin23t	10
15	0.15sin(100t+π/6)	0.016	0.15sin24t	11.5
16	0.16sin(100t+π/7)	0.017	0.16sin25t	12
17	0.17sin(100t+π/8)	0.018	0.17sin26t	12.5
18	0.18sin(100t+π/9)	0.019	0.18sin27t	13
19	0.19sin(100t+π/10)	0.02	0.19sin28t	13.5
20	0.2sin(100t+π/11)	0.021	0.20sin29t	14
21	0.21sin(100t+π/12)	0.022	0.21sin30t	14.5
22	0.22sin(100t+π/13)	0.023	0.22sin31t	15
23	0.23sin(100t+π/14)	0.024	0.23sin32t	9
24	0.24sin(100t+π/15)	0.025	0.24sin33t	9.5
25	0.25sin(100t+π/2)	0.026	0.25sin34t	10
26	0.26sin(100t+π/3)	0.027	0.26sin35t	10.5
27	0.27sin(100t+π/4)	0.028	0.27sin36t	11
28	0.28sin(100t+π/5)	0.029	0.28sin37t	11.5
29	0.29sin(100t+π/6)	0.03	0.29sin38t	12

Группа К3215				
Вар.	x	y	z	$E_П$
1	0.005	0.15sin100t	0.005sin(100t+π/3)	9
2	0.01	0.155sin150t	0.01sin(100t+π/4)	9.5
3	0.015	0.16sin200t	0.015sin(100t+π/5)	10
4	0.02	0.165sin250t	0.02sin(100t+π/6)	11.5
5	0.025	0.17sin300t	0.025sin(100t+π/7)	12
6	0.03	0.175sin350t	0.03sin(100t+π/8)	12.5
7	0.035	0.18sin400t	0.035sin(100t+π/9)	13
8	0.04	0.185sin450t	0.04sin(100t+π/10)	13.5
9	0.045	0.19sin500t	0.045sin(100t+π/11)	14
10	0.05	0.195sin550t	0.05sin(100t+π/12)	14.5
11	0.055	0.2sin600t	0.055sin(100t+π/2)	15
12	0.06	0.205sin650t	0.06sin(100t+π/3)	9
13	0.065	0.21sin700t	0.065sin(100t+π/4)	9.5
14	0.07	0.215sin750t	0.07sin(100t+π/5)	10
15	0.075	0.22sin800t	0.075sin(100t+π/6)	11.5
16	0.08	0.225sin850t	0.08sin(100t+π/7)	12
17	0.085	0.23sin900t	0.085sin(100t+π/8)	12.5
18	0.09	0.235sin950t	0.09sin(100t+π/9)	13
19	0.095	0.24sin1000t	0.095sin(100t+π/10)	13.5
20	0.1	0.245sin1050t	0.1sin(100t+π/11)	14
21	0.105	0.25sin1100t	0.105sin(100t+π/12)	14.5
22	0.11	0.255sin1150t	0.11sin(100t+π/13)	15
23	0.115	0.26sin1200t	0.115sin(100t+π/14)	9
24	0.12	0.265sin1250t	0.12sin(100t+π/15)	9.5
25	0.125	0.27sin1300t	0.125sin(100t+π/2)	10
26	0.13	0.275sin1350t	0.13sin(100t+π/3)	10.5
27	0.135	0.28sin1400t	0.135sin(100t+π/4)	11
28	0.14	0.285sin1450t	0.14sin(100t+π/5)	11.5
29	0.145	0.29sin1500t	0.145sin(100t+π/6)	12

Группа К3220				
Вар.	x	y	z	$E_П$
1	0.15sin100t	0.005sin(100t+π/3)	0.005	9
2	0.155sin150t	0.01sin(100t+π/4)	0.01	9.5
3	0.16sin200t	0.015sin(100t+π/5)	0.015	10
4	0.165sin250t	0.02sin(100t+π/6)	0.02	11.5
5	0.17sin300t	0.025sin(100t+π/7)	0.025	12
6	0.175sin350t	0.03sin(100t+π/8)	0.03	12.5
7	0.18sin400t	0.035sin(100t+π/9)	0.035	13
8	0.185sin450t	0.04sin(100t+π/10)	0.04	13.5
9	0.19sin500t	0.045sin(100t+π/11)	0.045	14
10	0.195sin550t	0.05sin(100t+π/12)	0.05	14.5
11	0.2sin600t	0.055sin(100t+π/2)	0.055	15
12	0.205sin650t	0.06sin(100t+π/3)	0.06	9
13	0.21sin700t	0.065sin(100t+π/4)	0.065	9.5
14	0.215sin750t	0.07sin(100t+π/5)	0.07	10
15	0.22sin800t	0.075sin(100t+π/6)	0.075	11.5
16	0.225sin850t	0.08sin(100t+π/7)	0.08	12
17	0.23sin900t	0.085sin(100t+π/8)	0.085	12.5
18	0.235sin950t	0.09sin(100t+π/9)	0.09	13
19	0.24sin1000t	0.095sin(100t+π/10)	0.095	13.5
20	0.245sin1050t	0.1sin(100t+π/11)	0.1	14
21	0.25sin1100t	0.105sin(100t+π/12)	0.105	14.5
22	0.255sin1150t	0.11sin(100t+π/13)	0.11	15
23	0.26sin1200t	0.115sin(100t+π/14)	0.115	9
24	0.265sin1250t	0.12sin(100t+π/15)	0.12	9.5
25	0.27sin1300t	0.125sin(100t+π/2)	0.125	10
26	0.275sin1350t	0.13sin(100t+π/3)	0.13	10.5
27	0.28sin1400t	0.135sin(100t+π/4)	0.135	11
28	0.285sin1450t	0.14sin(100t+π/5)	0.14	11.5
29	0.29sin1500t	0.145sin(100t+π/6)	0.145	12