2. Determine, using the values given in TABLE A, the current I in the circuit of FIGURE 2 by:

(a) mesh analysis

(b) nodal analysis.

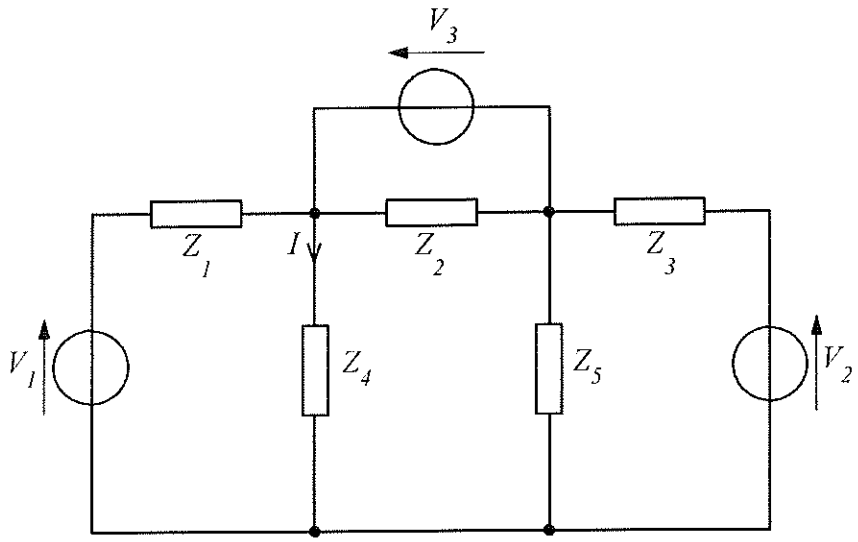
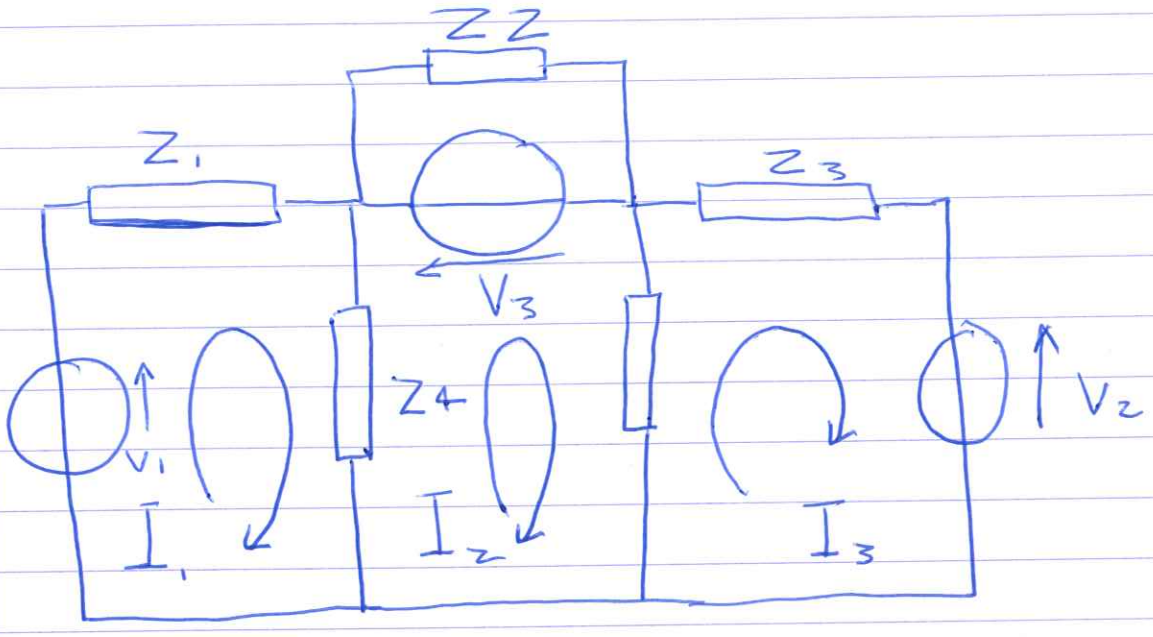


FIG. 2

V_1	$120\angle 0°$ V
V_2	$120\angle 90°$ V
V_3	$20\angle 45°$ V
Z_1	$2\ \Omega$
Z_2	$-j5\ \Omega$
Z_3	$4\ \Omega$
Z_4	$-j5\ \Omega$
Z_5	$j4\ \Omega$

TABLE A



Redrawn circuit

$$V3 = 14.14 + J14.14$$

loop 1

$$120 - (2)I_1 - (I_1 - I_2)(-J5) = 0$$

loop 2

$$(-J5)(I_2 - I_1) + J4(I_2 - I_3 - 14.14 + J14.14$$

loop 3

$$0 = J4(I_3 - I_2) + 4(I_3) - J120$$

put in form of

Volts =

~~120 =~~

loop 1

$0 = 120 - (2)I_1 - (I_1 - I_2)(-J5) = 0$

$120 = 2I_1 + \cancel{J5I_1} - J5I_1 + J5I_2$

Volts $= 120 = 2 - J5I_1 + J5I_2$

loop 2

$0 = (-J5)(I_2 - I_1) + (J4)(I_2 - I_3) - 14.14 + J14.14$

Volts $= 14.14 + J14.14$

$14.14 + J14.14 = J5I_1 - J5I_2 + J4I_2$

$- J4(I_3)$

$14.14 + J14.14 = J5I_1 - J1I_2 - J4I_3$

loop 3

$0 = \cancel{J4(} J4(I_3 - I_2) + 4(I_3) - J120$

Volts $= 120 = J4I_3 - J4I_2 + 4I_3$

So $J120 = (4 + J4)I_3 - J4I_2$