$\frac{1}{7} + \frac{1}{14})^{-1}$

Tan Zhi Yong 03S

Subject:

1a) $R_{total} = 6 + (\frac{1}{7} + (5 + (\frac{1}{5} + \frac{1}{6})^{-1})^{-1}]^{-1}$

$= 6 + 2\frac{4}{5}$

$= 8.8\ \Omega$ (s.f)

1b) $R_{total} = 7 + [\frac{1}{2} + \frac{1}{12}]^{-1}$

$= 7 + [\frac{13}{22} + ...$

$= 8.36\ \Omega$ (

2a) $R_{A\&C} = [\frac{1}{12} + \frac{1}{6} + ...$

$= 3.0\ \Omega$

2b) $R_{A\&D} = [\frac{1}{6.0} + \frac{1}{[\frac{1}{6.0} + ...]}]^{-1}$

$= [\frac{1}{6.0} + \frac{6}{25}]^{-1}$

$= 3.75\ \Omega$

$V_x = 2 - \frac{4}{3}$

$= \frac{2}{3}$ V

$V_y = 2 - \frac{2}{3}$

$= \frac{4}{3}$ V

P.d. across XY $= V_x - V_y$

$= \frac{2}{3} - \frac{4}{3}$

$= -\frac{2}{3}$ V

3) $R_{total} = [\frac{1}{15} + \frac{1}{15}]$ s.f)

$= 7.5\ \Omega$

$I_{total} = \frac{V}{R}$

$= \frac{2.0}{7.5}$

$= 0.267$ A (3

4a) $V_T = \frac{R_2}{R_1 + R_2}(12.0)\ \Omega$ (3s.f)

$3.0 = \frac{R_2}{10.0 + R_2}(1$

$30.0 + 3.0R_2 = 12$ (12.0)

$9.0R_2 = 30.0$ s.f)

$R_2 = 3.33$

4b) $V_T = \frac{(3.333 + 17.0)}{[\frac{1}{3.333} + \frac{1}{7.0}]^{-1} + 10}$

$= 2.21$ V (3

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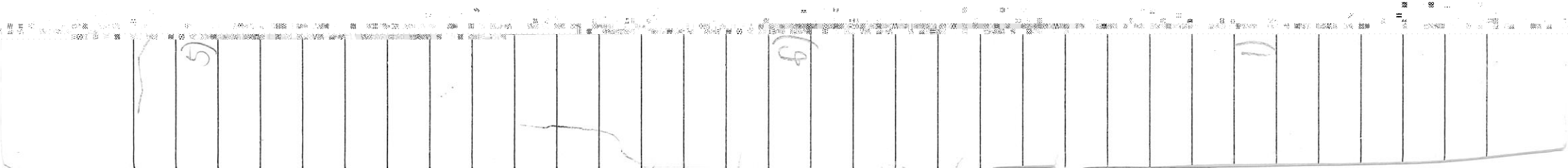

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3) $\frac{R}{1000+R}(30) = 10$

$\frac{R}{1000+R} = \frac{1}{3}$

$R = \frac{1000}{3} + \frac{R}{3}$

$\frac{2R}{3} = \frac{1000}{3}$

$R = 500\,\Omega$

5) $I_{initial} = \frac{V}{R}$

$= \frac{1.5}{2995+5+2000}$

$= 3.75 \times 10^{-4}\,A$

$I_{final} = \frac{1.5}{2995+5+1000}$

$= 3 \times 10^{-4}\,A$

Scale reading $= 20\left(\frac{3.75}{3}\right)$

$= 25$

4) $V_{AB} = \frac{R_{AB}}{R_T}\,9$

$= 1.818\,V$

$1.818\,V \rightarrow 100\,cm$

$1.5\,V \Rightarrow 1.5 \times \frac{1.818}{100}$

$= 82.5\,cm$

Reading $= \frac{\left(\frac{1}{1}+\frac{1}{20}\right)^{-1}}{\left(\frac{1}{1}+\frac{1}{20}+1+1\right)^{-1}} \times 9$

$= 1.29\,V$

6)

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