

[Assignment NO-3 for EE-4th Sem. students] [Sub: EEM] . April

Solution & hints of Assignment No-03 EE-4th sem. Sub: EEM

Ques: (4th) (i) for series connection.

$R_1 = 50 \pm 2\%$. Convert this in value form. $\rightarrow 50 \pm 1$ (50 of 2% is 1)
 [It is given in limiting error form] ↙ converted in value form

$$R_2 = 37 \pm 2\% \rightarrow 37 \pm (0.75)$$

$$R_3 = 75 \pm 2\% \rightarrow 75 \pm 1.5$$

$$R_1 + R_2 + R_3 = (50 + 37 + 75) \pm (1 + 0.75 + 1.5)$$

$$= 162 \pm 3.25 \rightarrow \text{Convert this in \% form.}$$

$$\frac{\text{nominal value} \times x}{100} = \text{error value}$$

if question asked for %age

$$\text{then } = 158.75 \rightarrow 162.25$$

$$\frac{162 \times x}{100} = 3.25$$

$$x = \frac{325}{162} = 2.006\%$$

then

$$\boxed{R_{eq} = 162 \pm 2.006\%} \text{ limiting error}$$

April
02/04/20

for IIIrd connection

Solve mind for que-4 (ii) Assignment-3 EET^h sem - EETM

$$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

$$= \frac{(R_2 R_3 + R_1 R_3 + R_1 R_2)}{R_1 R_2 R_3}$$

$$R_{eq} = \frac{R_1 R_2 R_3}{(R_2 R_3 + R_1 R_3 + R_1 R_2)}$$

$$= \frac{[(50 \pm 2\%) (37 \pm 2\%) (75 \pm 2\%)]}{[(37 \pm 2\%) (75 \pm 2\%) + (50 \pm 2\%) (75 \pm 2\%) + (50 \pm 2\%) (37 \pm 2\%)]}$$

$$= \frac{(138750 \pm 6\%)}{[(2775 \pm 4\%) (3750 \pm 4\%) + (1850 \pm 4\%)]}$$

multiplication of value (50 x 37 x 75)
Addition of error (2+2+2) = 6%

$$= \frac{(138750 \pm 6\%)}{(2775 \pm 111) + (3750 \pm 150) + (1850 \pm 74)}$$

convert this in value form

$$= \frac{(138750 \pm 6\%)}{(8350 \pm 335)}$$

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convert this in (%) form

$$= \frac{(8350)}{(8350)} \times \frac{335}{100} = 4.011\%$$

nominal value x % = 335 (error)

$$= \frac{(138750 \pm 6\%)}{(8350 \pm 4.011\%)}$$

$$\frac{138750}{8350} = 16.61 \Omega$$

Direct division as in value form

$$(6 - 4.011) = 1.989 \Omega$$

as in percentage so don't divide only subtract (upper-lower)

$$\boxed{R_{eq} = 16.61 \pm 1.989 \Omega}$$

Ans
05/04/20